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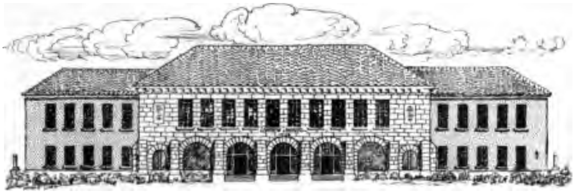

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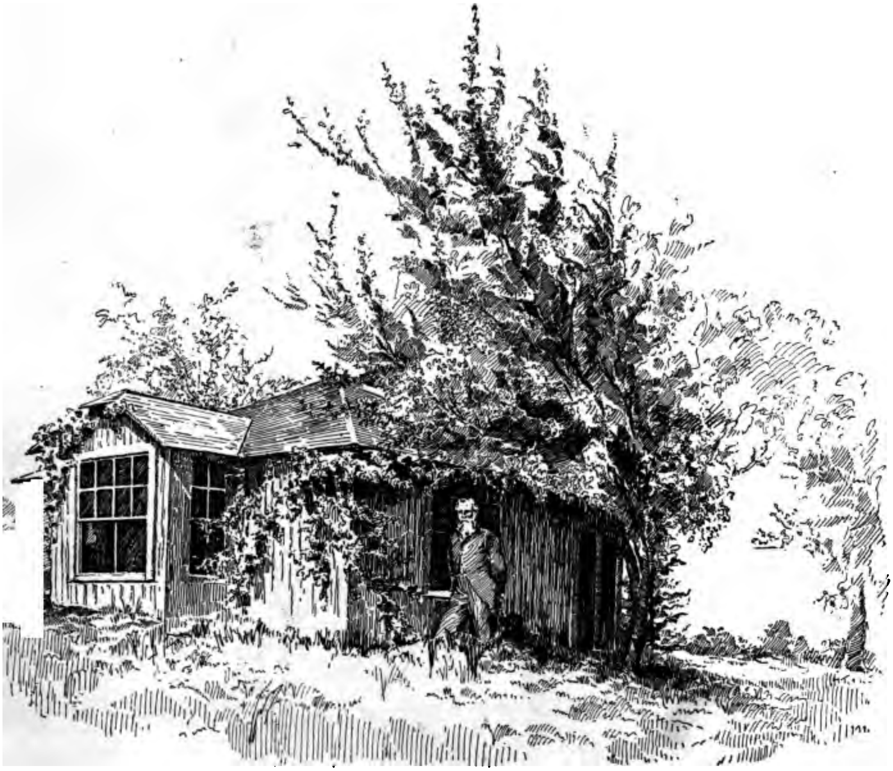

JOHN BURROUGHS'S STUDY AT RIVERBY, WEST PARK, N. Y.

LITTLE NATURE STUDIES

FOR

LITTLE PEOPLE

FROM THE ESSAYS OF

JOHN BURROUGHS

AN INTRODUCTION TO THE STUDY OF

SCIENCE AND NATURE

FOR PRIMARY GRADES

EDITED BY

MARY E. BURT

AUTHOR OF "LITERARY LANDMARKS," "STORIES FROM PLATO," ETC.

BOSTON, U.S.A.
PUBLISHED BY GINN & COMPANY
1895

DEPARTMENT OF EDUCATION

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PREFACE.

THIS book is intended as a primary text-book in Science and Reading. The motive in it is to introduce teacher and pupil to a mutual love for the woods and fields, to the study of animals and plants, to the observation of real things in life, and to the methods of a true naturalist. It should take teacher and pupil out of doors, into the open air, and to the heart of nature. Incidentally it will doubtless lead to the acquisition of the power to read and to a taste for the quiet and elegant literature of a pastoral writer.

M. E. BURT,
Editor.

Thanks are extended to Messrs. Houghton, Mifflin & Co., for such extracts as they have permitted from their copyrighted editions of the Essays of John Burroughs.

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INTRODUCTION.

LOVERS OF NATURE.

DR. JOHNSON said he had lived in London so long that he had ceased to note the changes of the seasons. But Dr. Johnson was not a lover of nature. Of that feeling for the country of which Wordsworth's poetry, for instance, is so full, he probably had not a vestige. Think of Wordsworth shut up year in and year out in the city! That lover of shepherds, of mountains, of lonely tarns, of sounding waterfalls,

> "Who looked upon the hills with tenderness,
> And made dear friendships with the streams and groves."

Dr. Johnson's delight was in men and in verbal fisticuffs with them, but Wordsworth seemed to have loved nature more than men; at least he was drawn most to those men who lived closest to nature and were more a part of her. Thus he says he loved the shepherds, "dwellers in the valleys,"

> "Not verily
> For their own sakes, but for the fields and hills
> Where was their occupation and abode."

Your real lover of nature does not love the merely beautiful things which he culls here and there; he loves the earth itself, the faces of the hills and mountains, the rocks, the streams, the naked trees no less than the leafy trees, a plowed field no less than a green meadow. He does not know what it is that draws him. It is not beauty, any more than it is beauty in his father or mother that makes him love them. It is "something far more deeply interfused." Something native and kindred that calls to him. In certain moods how good the earth, the soil, seems! One wants to feel it with his hands and smell it — almost taste it. Indeed, I never see a horse eat soil and sods, without a feeling that I would like to taste it too. The rind of the earth, of this "round and delicious globe" which has hung so long upon the great Newtonian tree, ripening in the sun, must be sweet.

I recall an Irish girl lately come to this country, who worked for us, and who, when I dug and brought to the kitchen the first early potatoes, felt them, and stroked them with her hand, and smelled them, and was loth to lay them down, they were so full of suggestion of the dear land and home she had so lately left. I suppose it was a happy surprise to her to find that the earth had the same fresh, moist smell here that it had in Ireland, and yielded the same fresh crisp tubers. The canny creature had always worked in the fields, and the love of the soil and of homely country things was deep in her heart. Another emigrant from over the seas, a laboring man confined to the town, said to me in his last illness, that he believed he would get well if he could again walk in the fields. A Frenchman who fled the city and came to the country, said, with an impressive gesture, that he wanted to be where he could see the blue sky over his head.

These little incidents are but glints or faint gleams of that love of nature to which I would point an affection for the country itself, and not a mere passing admiration for its beauties. A great many people admire nature; they write admiring things about her; they apostrophize her beauties; they describe minutely pretty scenes here and there; they climb mountains to see the sun set, or the sun rise, or make long journeys to find waterfalls, but nature's real lover listens to their enthusiasm with coolness and indifference. Nature is not to be praised or patronized. You cannot go to her and describe her; she must speak through your heart. The woods and fields must melt into your mind, dissolved by your love for them. Did they not melt into Wordsworth's mind? They colored all his thoughts; the solitude of those green, rocky Westmoreland fells broods over every page. He does not tell us how beautiful he finds nature and how much he enjoys her, he makes us share his enjoyment.

There are serious drawbacks in some of the books of the lamented Richard Jeffries; there is too minute description of phases and objects in nature *from the outside.* The page is often wearisome from the long and careful enumeration of details. There is a deficiency of imagination in his style. He is descriptive, but rarely interpretative; the mood, the frame of mind which nature herself begets, he rarely imparts to us. Of course what we love in nature is some suggestion of ourselves, of the human spirit, and no labored description, or careful enumeration of details will bring us to this.

"Nor do words,
Which practiced talent readily affords,
Prove that her hand has touched responsive chords."

The writer is trying to evoke what is not there, and gives us what his eye sees without, instead of the impression the object makes within. Of course the method here hinted at, is not the method of science, but it is the method of literature, of art, the only method that can give us whole and fresh results. The passion for nature is by no means a curiosity about her, or an itching to portray certain of her features ; it lies deeper and is probably a form of, or closely related to, our religious instincts. When you go to nature, bring us good science or else good literature, and not a mere inventory of what you have seen. One demonstrates, the other interprets.

In the Journals of Thoreau published since his death, there is a good deal of mere descriptive writing that is tedious. This is not observation, though it is constantly regarded as such. Observation is selective and vital. A real observation begets warmth and joy in the mind. To see things in detail as they lie about you and enumerate them is not observation ; but to see the significant things, to seize the quick movement and gesture, to disentangle the threads of relation, to know the nerves that thrill from the cords that bind, or the typical and vital from the commonplace and mechanical — that is to be an observer. * * *

Moralizing about nature is tedious enough, and unless the piece has some moral or emotional background it does not touch us. To describe a thing for the mere sake of describing it, to make a dead set at it like a reporter, whatever may be the case in painting, it will not do in literature. The object must be informed with meaning, and to do this the creative touch of imagination is required. * * *

In literature, never nature for her own sake, but for the sake of the soul which is over and above all.

JOHN BURROUGHS in *The Chautauquan.*

PART I.

LESSON I.

(The teacher's page.)

The unit of thinking is an entire thought and its expression is an entire sentence.
— FARNHAM.

A BRAVE MOUSE.

The teacher will read or tell the story to the pupils and hold a conversation with them about it.

I MET a little mouse in my travels the other day that interested me. He was on his travels also, and we met in the middle of a mountain lake. I was casting my fly there when I saw just sketched or etched upon the glassy surface a delicate V-shaped figure, the point of which reached about the middle of the lake, while the two sides as they diverged faded out toward the shore. I saw the point of this V was being slowly pushed towards the opposite shore. I drew near in my boat, and beheld a little mouse swimming vigorously for the opposite shore. His little legs appeared like swiftly revolving wheels beneath him. As I came near he dived under the water to escape me, but came up again like a cork and just as quickly. It was laughable to see him repeatedly duck beneath the surface and pop back again in a twinkling. He could not keep under water more than a second or two. Presently I reached him my oar when he ran up it and into the palm of my hand, where he sat for some time and arranged his fur and warmed himself. He did not show the slightest fear. It was probably the first time he had ever shaken hands with a human being. He was what we call a meadow mouse, but he had doubtless lived all his life in the woods and was strangely unsophisticated. How his little round eyes did shine and how he sniffed me to find out if I was more dangerous than I appeared to his sight.

After a while I put him down in the bottom of the boat and resumed my fishing. But it was not long before he became very restless and evidently wanted to go about his business. He would climb up to the edge of the boat and peer down into the water. Finally he could brook the delay no longer and plunged boldly overboard, but he had either changed his mind or lost his reckoning, for he started back in the direction he had come and the last I saw of him he was a mere speck vanishing in the shadows near the other shore.

LESSON I (*continued*).

(The child's page.)

A BRAVE MOUSE.

A

mouse

sat

on my hand.

NOTE TO THE TEACHER.

Let the child tell the story read to him from the preceding page. Put one or two of his own sentences onto the blackboard and let him read them.

The man met the mouse. The man took the mouse in his hand.

The real point in the lesson is the sympathy of the man for the timid, helpless little creature. The real object of the lesson, to develop the child's curiosity in regard to the habits of animals and a spirit of kindliness toward them.

This should not be lost in an anxiety to get words. One word a day is all that a [illegible]n be expected to get.

PEDAGOGICAL PRINCIPLES IN TEACHING READING AND SCIENCE.

(The teacher's page.)

THE OBSERVATION OF NATURE.

A GREAT deal of delusion exists in the minds of people on the subject of observing nature. Observation of nature is mainly a matter of sympathy and attraction. One must love nature, then observation is easy, and what is more, it is joyous. Things come to you. You are in vital connection with them. You must have the bird in your heart before you can find it in the bush, and when you once have it in your heart, the finding of it in the bush is a secondary matter.

JOHN BURROUGHS in *The Chautauquan.*

JUST as great a delusion exists in the minds of bookmakers in regard to the foundation work in reading. It has been assumed for years that a child can learn to read more easily by making the chief motive that of word-getting. When the child's mind is aglow with ideas the words come as a secondary matter. The child is then "in vital connection" with the words.

LESSON II.

A BRAVE MOUSE.

A small
mouse.

A large
mouse.

I see a small mouse
and a large mouse.

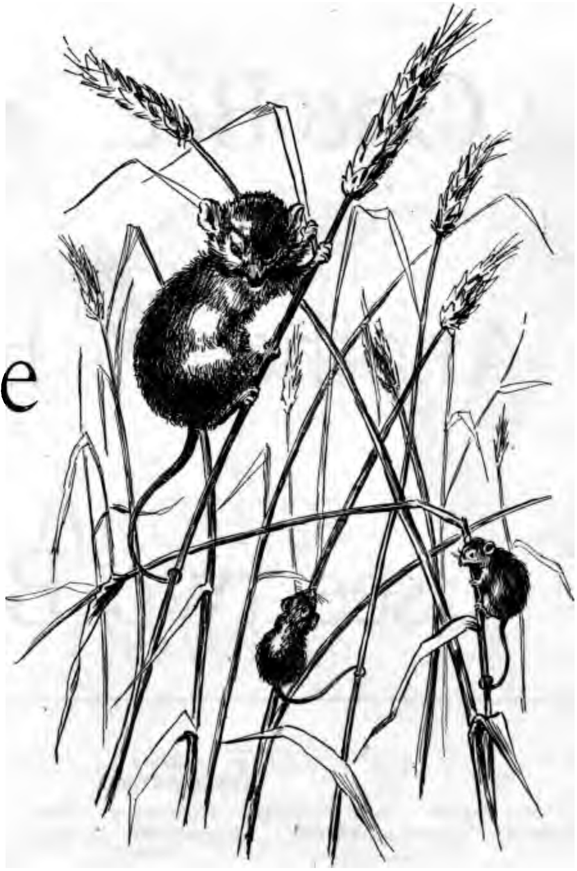
CONVERSATION.

TEACHER. I wonder if this large mouse is the mouse that was swimming in the lake. The writer said he found a little field mouse in her nest out in the field with a lot of young ones. She fled from the nest in great fear, but came back and carried off one at a time by the neck, as a cat carries off her kittens. Let the children tell what they have seen of the same sort of action. Put one or two of their sentences onto the blackboard.

LESSON III.

THE BRAVE MOUSE AT HOME.

I see
a
large
mouse
and
two
small
mice.



CONVERSATION.

TEACHER. Tell the story in the picture. Let us put onto the blackboard all the words you have learned. One. Two. Mouse. Mice. Large. Small. Sat. Man. How does the little field mouse seem to live when at home? The field mouse sometimes lives under a stone. See "Notes by the Way," Houghton, Mifflin & Co.

LESSON IV.

ONE AND ANOTHER.

One Bee.

Another Bee.

I see two Bees.

CONVERSATION.

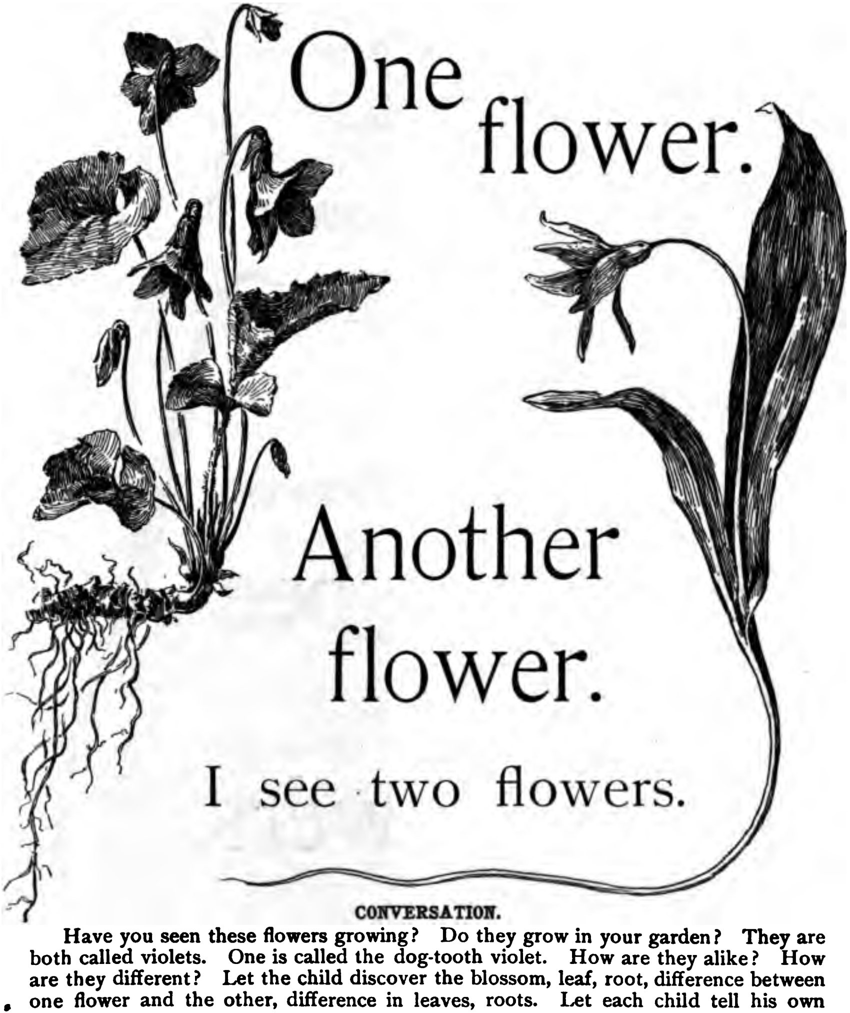
Has the bee a head? Wings? How many? How many has a bird? How many legs? Parts of the body? Compare with the mouse.

Lesson in word-building on the blackboard.

An, man, can, At, sat, mat.
An, and, hand. See, bee, bees.
An, another.

LESSON V.

ONE AND ANOTHER.



One flower.

Another flower.

I see two flowers.

CONVERSATION.

Have you seen these flowers growing? Do they grow in your garden? They are both called violets. One is called the dog-tooth violet. How are they alike? How are they different? Let the child discover the blossom, leaf, root, difference between one flower and the other, difference in leaves, roots. Let each child tell his own little story about the flower he loves best. There should always be some simple flower growing in the school-room. It is wonderful the pleasure and knowledge one flower will give. I have had the good fortune to watch a class for a year whose best flower study was a cyclamen. It proved to be the basis of many reading lessons.

LESSON VI.

ONE AND TWO.

One

flower.

Another

flower.

I see one bee

and

Two flowers.

CONVERSATION.

Have you seen these flowers growing? Are they like the flowers in the lesson before this? In what way are they alike? Different? What has the bee to do with the flower? What does it want of the flower? What does the flower want of the bee? (See Gibson's Essays.) Let the child discover the petals of the apple-blossom and compare with those of the spring beauty. Put short sentences onto the blackboard.

LESSON VII.

REVIEW.

RECOGNITION OF SENTENCES AND IDEAS.

1. A mouse sat on my hand.
2. I saw a large mouse and a small mouse.
3. I saw a large mouse and two small mice.
4. I saw one bee and another bee.
5. I saw two bees.
6. I saw two flowers.
7. I saw one flower and another flower.
8. I saw one bee and two flowers.

RECOGNITION OF WORDS.

mouse
large
bee
hand
flower
a
small
two
another
one
and
on
my
bees
sat

WORD-BUILDING.

at
s-at
r-at

an
m-an
man's

and
h-and
b-and

other
m-other
an-other

all
sm-all
b-all

LESSON VIII.

(The teacher's page.)

A WOLF IN SPIDER'S CLOTHING.

I ONCE saw a spider, probably the wolf spider, kill a young toad. When perceived he was dragging the toad along over the plowed ground. The toad was of course small, yet a good deal larger than the spider. The toad was alive, but died very soon after when the spider left him, alarmed no doubt by my presence, and hid under a clod. There is a spider in South America that kills small birds, and here is one at home that kills small toads. This wolf spider is a very savage creature. It spins no web by which to catch its game, but prowls about like a wolf and pounces upon its prey where it finds it. If you encounter one in your walk or confront him with a stick or the point of your cane, he is instantly up in an attitude of defense or will leap upon your stick and sink his poisonous fangs into it.

If I have seen an insect kill a toad, I have seen the little piping frog in the woods swallow an insect, the pretty green tree cricket; and it was a slow and laborious task for the little frog, too.

CONVERSATION.

Let the story be followed by a conversation on spiders and their habits and a comparison of their habits with that of the wolf or other animals. If possible let the children examine the nest of a trap-door spider. The pupils can tell many things they have observed spiders doing. We should learn to study carefully the habits of poisonous insects, for they have their use and are as interesting as other creatures.

LESSON IX.

(The child's page.)

A WOLF SPIDER.

web spins spider no

The wolf spider

spins no web.

The wolf spider spins no web.

LESSON X.

(The teacher's page.)

OPEN EARS AND EYES.

I AM often asked: "How do you observe nature?"

I always reply: "By simply keeping my eyes and ears open."

These organs, I find, are always on the alert and take note of what is going on without effort. A new sound at once arrests my attention; a live object is at once seized upon by my eye.

While getting on the train this morning I saw an eagle flying heavily northward. It is doubtful if any one else of the eight or ten people who boarded the train at the same time saw it.

As I got off the train in town I saw a little hawk flying over. As I passed up the street a few moments later I saw the hawk sitting on the cross on the top of a church steeple. Hawks come to town these winter days after the sparrows, and now and then they take one. I saw one swoop suddenly over a high-board fence one day and seize one of a flock of sparrows that were feeding in the middle of the street. As he made off with his game, the flock followed him a few rods and alighted in a pear tree in a garden, and looked in the direction their comrade had disappeared, and chirped and called disconsolately. The hawk came as if he had all the while been watching his opportunity like a cat. He swooped over the fence, seized his game, and was gone in a twinkling.

CONVERSATION.

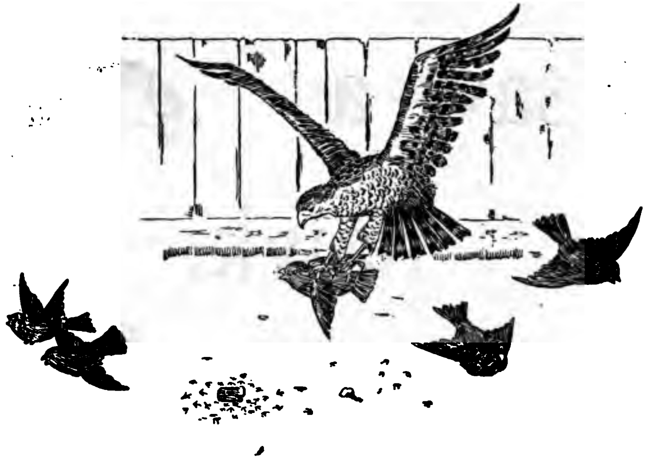
What have you seen wild birds do? What can you see in the picture on the next page? Are our eyes always open when they look as if they were open? How shall we see as naturalists do? Which is better, what we find in books or what we find out for ourselves? Let each child tell something that he has himself seen among birds.

LESSON XI.

(The child's page.)

OPEN EYES.

we see keep open eyes



We
can
see
if we
keep our eyes open.

one, two, three, four, five, little sparrows.

Lesson in word-building on the blackboard.

ē, wē, mē, bē, see, keep, three.

Lesson in counting.

one, two, three, four, five.

LESSON XII.

OPEN EYES.

see saw eyes open keep
one two three four five

I saw a hawk.

I heard a sparrow cry.

The hawk came down like a cat.

CONVERSATION.

What bird have you seen that looks like this? Why his beak is hooked. Why his eye is so sharp. Why he comes down like a cat.

Word-building and review of words on the blackboard.

ă, ăt, săt, cat, bat, fat, mat.

LESSON XIII.

REVIEW.

RECOGNITION OF SENTENCES.

1. The wolf-spider spins no web.
2. I saw a hawk.
3. I heard a sparrow cry.
4. We can see if we keep our eyes open.
5. The hawk comes down like a cat.

RECOGNITION OF PHRASES.

one flower.
my hand.
another bee.
spins no web.
large and small.

two flowers.
open eyes.
a spider's web.
a small mouse.
one and another.

WORD-MAKING.

sp-in	eye	an	pen	s-aw
sp-in-s	eye-s	c-an	o-pen	h-aw-k

RECOGNITION OF WORDS.

keep eyes another sparrow web
flower *spider* can hawk spin

LESSON XIV.

(The teacher's page.)

ON THE LOOKOUT.

AS I sat looking from my window the other morning upon a red squirrel gathering hickory nuts from a small hickory and storing them up in his den in the bank, I was forcibly reminded of the state of constant fear and apprehension in which the wild creatures live, and I tried to picture to myself what life would be to me, or to any of us, hedged about by so many dangers, real or imaginary.

The squirrel would shoot up the tree, making only a brown streak from the bottom to the top; would seize his nut and rush down again in the most precipitate manner. Half way to his den, which was not over three rods distant, he would rush up the trunk of another tree for a few yards to make an observation. No danger being near, he would dive into his den and reappear again in a twinkling.

Returning for another nut, he would mount the second tree again for another observation. Satisfied that the coast was clear, he would spin along the top of the ground to the tree that bore the nuts, shoot up it as before, seize the fruit, and then back again to his retreat.

Never did he fail during the half hour or more that I watched him to take an observation on his way both to and from his nest. It was "snatch and run" with him. Something seemed to say to him all the time: "Look out!" "The cat!" "The hawk!" "The owl!" "The boy with the gun!"

CONVERSATION.

The main point of the story, kindness to animals. Why animals are on the lookout. Has the squirrel a right to his food? Has the boy a right to shoot the squirrel? How to tame animals so that they will not be afraid. See "Cheating the Squirrel" in Pepaeton; also "The Flying Squirrel."

LESSON XIV (*continued*).

ON THE LOOKOUT.

cat hawk gun boy
look with out says

The squirrel says,

Look out!
The cat!
The hawk!
The boy
with the gun!

LESSON XV.

ON THE LOOKOUT.

(Continued.)

IT was a bleak December morning; the first fine flakes of a cold, driving snowstorm were just beginning to sift down, and the squirrel was eager to finish harvesting his nuts in time. It was quite touching to see how hurried and anxious and nervous he was. I felt like going out and lending a hand. The nuts were small, poor pignuts, and I thought of all the gnawing he would have to do to get at the scanty meat they held. My little boy took pity on a squirrel that lived in the wall near the gate, and cracked the nuts for him and put them upon a small board shelf in the tree, where he could sit and eat them at his ease.

The red squirrel is not so provident as the chipmunk. He scorns to lay up stores irregularly by fits and starts; he never has enough put up to carry him over the winter; hence he is more or less active all the season. Long before the December snow the chipmunk has for days been making hourly trips to his den with full pockets of nuts or corn or buckwheat, till his bin holds enough to carry him through to April. He need not, and, I believe, does not, set foot out of doors during the whole winter. But the red squirrel trusts more to luck.

As alert and watchful as the red squirrel is, he is frequently caught by the cat. My Nig, as black as ebony, knows well the taste of his flesh. I have known him to be caught by the black snake and successfully swallowed. The snake, no doubt, lay in ambush for him.

CONVERSATION.

Which is on the lookout, Nig or Red? Are both on the lookout? Let the children tell what they have observed of squirrels and compare their observations with those of the author.

LESSON XV.

NIG AND RED.

gate
black
near
cat
wall
Red
Nig
lived

My cat Nig is black.

Red lived in a wall near the gate.

Red is on the lookout.

LESSON XVI.

ON THE LOOKOUT.

(Continued.)

THIS fear, this ever-present source of danger of the wild creatures, we know little about. Probably the only person in the civilized countries who is no better off than the animals in this respect, is the Czar of Russia. He would not even dare gather nuts as openly as my squirrel. A blacker and more terrible cat than Nig would be lying in wait for him, and would make a meal of him. The early settlers in this country must have experienced something of this dread of apprehension from the Indians. Many African tribes now live in the same state of constant fear of the slave-catchers or of other hostile tribes. Our ancestors, back in prehistoric times, or, back of that, in geologic times, must have known fear as a constant feeling. Hence the prominence of fear in infants and children when compared with the youth or the grown person. Babies are nearly always afraid of strangers.

In the domestic animals also, fear is much more active in the young than in the old. Nearly every farm boy has seen a calf but a day or two old, which its mother has secreted in the woods or in a remote field, charge upon him furiously with a wild bleat when first discovered. After this first ebullition of fear it usually settles down into the tame humdrum of its bovine elders.

CONVERSATION.

How people lived in the early ages. Cave-dwellers. Why people are not afraid, like animals. How people can protect themselves through intelligence. The necessity of a spirit of kindness between people, lest they be in the same condition with the irrational animals. (See "Stories from Plato," Ginn & Co.)

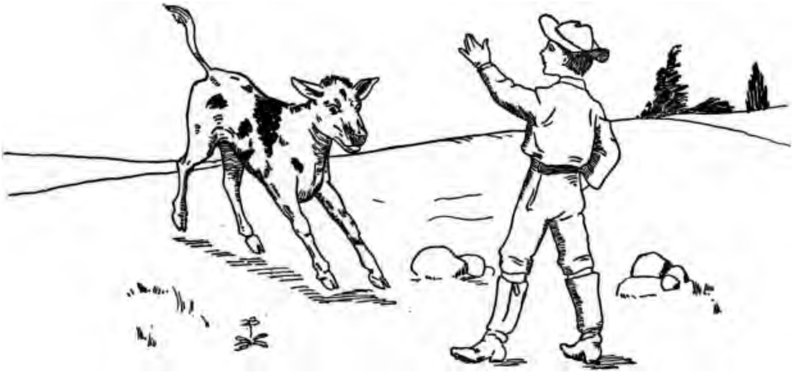
How horses are taught to be not afraid. Why the calf runs at the boy. The way to destroy fear is to face danger. Courage.

LESSON XVII.

ON THE LOOKOUT.

which afraid boy runs calf

The calf



runs at the boy.

Which is afraid?

LESSON XVIII

ON THE LOOKOUT.

(Continued.)

ETERNAL vigilance is the price of life with most of the wild creatures. There is only one among them whose wildness I cannot understand, and that is the common water turtle. Why is this creature so fearful? What are its enemies? I know of nothing that preys upon it. Yet, see how watchful and suspicious these turtles are as they sun themselves upon a log or a rock. Before you are fairly in gun-shot of them they slide down into the water and are gone.

The land turtle, or terrapin, on the other hand, shows scarcely a trace of fear. He will, indeed, pause in his walk when you are very near him, but he will not retreat into his shell till you have poked him with your foot or your cane. He appears to have no enemies, but the little spotted water turtle is as shy as if he were the delicate tid-bit that every creature is searching for. I did once find one which a fox had dug out of the mud in winter and carried a few rods and dropped on the snow, as if he had found he had no use for it.

One can understand the fearlessness of the skunk. Nearly every creature but the farm dog yields to him the right of way. All dread his terrible weapon. If you meet one in your walk in the twilight fields, the chances are that you will turn out for him, not he for you. He may even pursue you, just for the fun of seeing you run. He comes waltzing toward you, apparently, in the most hilarious spirits.

CONVERSATION.

Compare squirrel with turtle. There is a lady who has a squirrel and one of its teeth has grown very long. Why? Is it best to crack nuts for the squirrel? How does the squirrel keep his teeth short and sharp?

Short sentences on the blackboard.

The turtle suns himself on a log. The squirrel has a bushy tail. The turtle's shell is his box. The boy is on a box.

LESSON XIX.

ON THE LOOKOUT.

(Continued.)

My little boy took pity on a squirrel, and cracked the nuts for him.

He put them on a shelf in the tree where he could *sit* and eat them at his ease.

LESSON XX.

LIFE IN A BOX.

box
fox
in
live
does
why
turtle
found

I found
a box turtle.

A fox had
dug him
out of the mud.

When a box turtle is afraid
he hides in his box.

CONVERSATION.

Creatures that live in shells or boxes. The oyster, clam, crab, snail. If possible let the children have a turtle to examine. Perhaps there is no other creature more interesting to keep as a study in the school-room. I have seen a box-turtle kept for weeks. He grew so tame that he would eat meat from my hand and he contentedly strolled about the school-room to the delight of the pupils. He would bury himself in the earth under the roots of flowers in a flower-box, keeping an eye out to see what was going on. I have seen him climb up the window curtain and his attention was always gained by the organ-grinder in the street or when the boys whistled at *him. He had a head* and beak like an eagle.

LESSON XXI.

ON THE LOOKOUT

(*Continued.*)

THE fox is a very wild and suspicious creature, but, curiously enough, when you suddenly come face to face with him, when he is held by a trap or driven by the hound, his expression is not that of fear, but shame and guilt. He seems to diminish in size and to be overwhelmed with humiliation. Does he know himself to be an old thief, and is that the reason for his embarrassment? The fox has no enemies but man, and when he is fairly outwitted he looks the shame he evidently feels.

In the heart of the rabbit fear constantly abides. Her eyes are always open wide. She can see back and front and on all sides equal to a bird. The fox is after her, the owls are after her, the gunners are after her, and she has no defense but her speed. She always keeps well to cover. The northern hare keeps in the thickest brush. If the hare or rabbit crosses a broad open exposure, it does so hurriedly, like a mouse when it crosses the road. The mouse is liable to be pounced upon by a hawk, and the hare or rabbit by the snowy owl, or else the great horned owl.

A friend of mine was following one morning a fresh rabbit track through an open field. Suddenly the track came to an end, as if the creature had taken wings — as it had after an unpleasant fashion. There, on either side of its last foot imprint, were several parallel lines in the snow, made by the wings of the great owl that had swooped down and carried it off. What a little tragedy was seen written there upon the white, even surface of the field!

The rabbit has not much wit. I once, when a boy, saw one that had been recently caught, liberated in an open field in the presence of a dog that was being held a few yards away. But the poor thing lost all presence of mind and was quickly caught by the clumsy dog.

LESSON XXII.

THE FOX.

wild why thief know ashamed
dug mud left snow looks

A fox dug a turtle out of the mud.

The fox left the turtle on the snow.
Why? The fox is wild.

He knows that he is a thief and
so he looks ashamed.

Is the fox really a thief? Does he really look ashamed? Sensitiveness of animals. Their anxiety to be well thought of. Habits of the fox.

Lesson in word-building.

ŏx, fŏx, bŏx. ŭ, mŭd, dŭg. ō, snōw, knōw, sō.

LESSON XXIII.

THE RABBIT.

hawks
fox
owls
gunners
safe
life
rabbit
after
color
helps

The rabbit
has
a life of fear.

The hawk is
after her.

The fox is after her.

The owls are after her.

The gunners are after her.

Her color helps to keep her safe.

CONVERSATION.

Imagination. Why children are afraid. Courage. How to cultivate courage. What different animals do to keep themselves safe. Make the lesson turn on the kindness of the great power that protects.

LESSON XXIV.

ON THE LOOKOUT.

(*Continued.*)

I SAW the same experiment tried with a red squirrel with quite opposite results. The boy who had caught the squirrel in his wire trap had a very bright and nimble dog about the size of a fox that seemed to be very sure he could catch a red squirrel under any circumstances if only the trees were out of the way. So the boy went to the middle of an open field with his caged squirrel, the dog, who seemed to know what was up, dancing and jumping about him. It was in midwinter; the snow had a firm crust that held boy and dog alike. The dog was drawn back a few yards and the squirrel liberated. Then began one of the most exciting races I have witnessed for a long time. The squirrel had all his wits about him and kept them ready for instant use. He did not show the slightest confusion. He was no match for the dog in fair running, and he discovered this fact in less than three seconds ; he must win, if at all, by strategy. Not a straight course for the nearest tree, but a zigzag course, yea, a double or treble zigzag course. Every instant the dog was sure the squirrel was his, and every instant he was disappointed. It was incredible and bewildering to him. The squirrel dodged this way and that. The dog looked astonished and vexed. Then the squirrel issued from between his hind legs, and made three jumps toward the woods before he was discovered.

LESSON XXIV.

ON THE LOOKOUT.

(Continued.)

IT was evident the squirrel would win. The dog seemed to redouble his efforts. He would overshoot the game or shoot by it to the right or left. The squirrel was the smaller craft and could out-tack him easily. One more leap and the squirrel was up a tree, and the dog was overwhelmed with confusion and disgust.

He could not believe his senses. "Not catch a squirrel in such a field as that? Go to, I will have him yet!" and he bounds up the tree as high as one's head, and then bites the bark of it in his anger and chagrin.

The boy says his dog has never bragged since about catching red squirrels "if only the trees were out of reach"!

No matter how quickly nor how often the sparrow or the finch changes its course, its enemy changes, simultaneously, as if every move was known to it from the first.

The same thing may be noticed among the birds in their love chasings; the pursuer seems to know perfectly the mind of the pursued. This concert of action among birds is very curious. When they are on the alert, a flock of sparrows, or pigeons, or cedar birds, or snow buntings, or blackbirds, will all take flight as if there was but one bird, instead of a hundred. The same impulse seizes every individual bird at the same instant, as if they were sprung by electricity.

Or when a flock of birds is in flight, it is still one body, one will; it will rise or circle, or swoop, with a unity that is truly astonishing. A flock of snow buntings will perform their aerial evolutions with the precision that the best-trained soldiery cannot equal. Have the birds an extra sense which we have not? A brood of young partridges in the woods will start up like an explosion, every brown particle and fragment hurled into the air at the same instant. Without word or signal, how is it done?

LESSON XXV.

REVIEW.

WORDS AT SIGHT.

ā
gate
afraid
came

ă
at
cat
sat
an
man
man's
and
hand
after
rabbit

o͝o
look
book
took

ē
he
we
the

e͞e
bee
see
tree
three
keep

ĕ
red
web
help

ẽr
her

ä
are
large

ī
mice
five
like
spider
wild
life

ĭ
in
spin
lived
is
his
it
sit
little
pity
if
nig

ō
no
home
open
snow
know

ŏ
on
ox
box
fox

ȧ
all
small
hawk
ball
call
fall

ȳ
my
why

ŭ
run
runs
mud
dug
nut
nuts
gun
gunners

ou
out
mouse
house

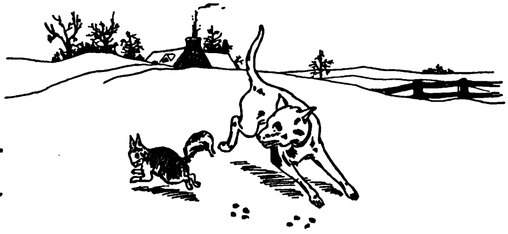
oy
boy

LESSON XXVI.

THE RACE.

catch	have	go	will	get
that	him	not	squirrel	yet

Can I



not

catch that squirrel?

Go to!

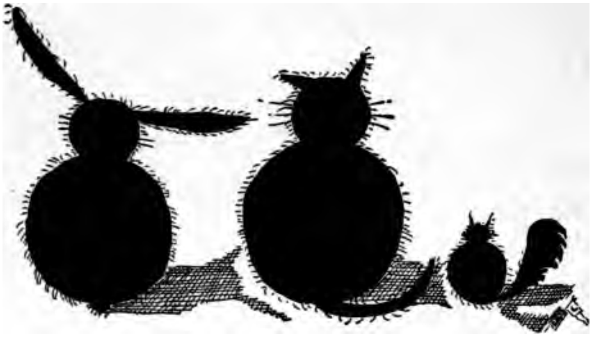
I will have him yet.

CONVERSATION.

Rapidity with which animals move. Carrier pigeons fly, squirrels run, etc. Alertness of animals.

LESSON XXVII.

THE CAT.



Bun. Nig. Red.

Nig is black as ink.

She knows the taste

of the squirrel.

REVIEW.

The illustration above was done by a young boy. Let the children practice drawing from life and making silhouettes. Review on blackboard the words contained in all the lessons on this essay.

LESSON XXVIII.

THE APPLE.

sugar apple is of full

The

apple

is

full of sugar.

The apple is full of sugar.

CONVERSATION.

The sugar in the apple. The apple, shape, size, color. The surface. The core. How the apple is held onto the tree. The seeds, how many, why, the direction in which they point. Why the apple "loves cold countries." Use of the apple. Comparison with other fruits. (See "Our Rural Divinity" and "Essay on the Apple," published by Houghton, Mifflin & Co.)

LESSON XXIX.

THE APPLE.

The
apple
is

full of sunshine.

The apple is full of sunshine.

CONVERSATION.

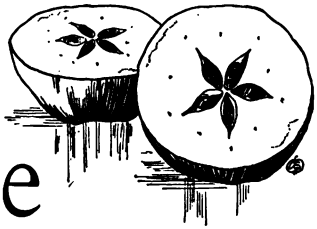
What the author means by the apple being full of sunshine. Effect of sunshine on all life. Why there is such a pleasant taste to grape juice, apple juice, currants, and other fruit. It is the sunshine. We eat and drink sunshine. Why the ancients worshipped the sun. Effect of sunshine on the color of fruit. Where does the apple get its red cheek?

LESSON XXX.

THE APPLE.

rose blooms ripe when
sunshine

The
apple
is a rose
when it blooms



and
a rose
when it is ripe.

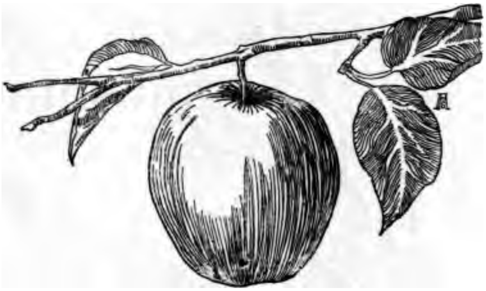
CONVERSATION.

Before reading this lesson, the child should have the opportunity of examining the cross section of an apple to find "the rose in its heart," and also the picture of a rose and of an apple blossom. He will discover for himself that the apple belongs to the rose-family. *Sentences* on the blackboard.

LESSON XXXI.

THE APPLE.

(Review.)



The apple is full
of sunshine,
and it is full of
sugar.
The apple is a rose when it blooms
and a rose when it is ripe.

---

căn
catch
apple
that
as
black
have

hĭm
will
is
ink
—
shē

tāste
—
full
sugar
—
squirrel
blo͞oms

nŏt
of
—
gō
knows
rose

gĕt
yet
when
—
rīpe
Bŭn
sunshine

CONVERSATION AND SCIENCE WORK.

Examine cross sections of apples, pears and other fruit. Comparisons.

The child has now had thirty-one lessons. Does he know thirty-one words? It is sufficient. Has he learned thirty new facts? It is well. But words and facts are externalities. They are not vital. They are not the standard by which to measure. Is the child more alert to see good in everything? Does he love nature better? Is *he more kindly?* "*The life* is more than the meat."

LESSON XXXII.

THE COW AND THE APPLE.

friend
pick
taste
wakes
about
need
ripe
there
ones
out

The cow
is the friend
of the apple.
The taste of the
apple wakes her up.

No need to pick out
the ripe ones for her.

An apple is an apple.
There is no best about it.

TOPICS FOR DISCUSSION.

Why the cow loves the apple. What else she will help herself to. Let each pupil tell what he has observed of the cow. I have seen bees in the city and birds help themselves to apples. Browsing. What goats browse on. (See "Our Rural Divinity," *also Thoreau's* essay, "Wild Apples.")

LESSON XXXIII.

BIRDS.

birds good apple-tree
crop has

The
apple-
tree

has
a good crop of birds.

TOPICS FOR DISCUSSION.

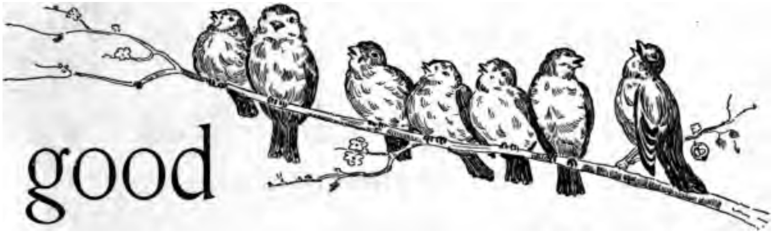
Why an old tree is hollow. What has happened to the inside of the tree. Trees growing from the outside. Use of hollow trees as homes for animals. Review lesson from blackboard, making new sentences from the vocabulary of the last five lessons *such as,* "The bird is the friend of the apple-tree." Destroys insects. "The apple-*tree is the friend of the bird.*" Gives it a home.

LESSON XXXIV.

BIRDS.

young
most
apples
bears
birds
trees
but
may

Another good crop of birds.



Young trees may be
best for apples.
But an old tree
bears the most birds.

TOPICS FOR DISCUSSION.

The meaning of the writer, "crop of birds," "crop of grain." Why the young tree has more apples. Why the old tree is more easily hollowed out. Birds that live in hollow trees. What kind of beaks.

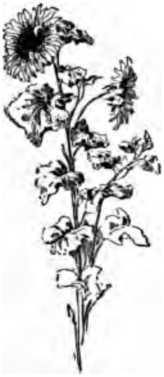
Reading-lessons should do more than teach reading—they should educate.
WILBUR S. JACKMAN.

LESSON XXXV.

REVIEW.

1. A bee saw an apple.
2. The bee loves the apple for its sugar.
3. The bee does not like the spider's web.
4. Red is a squirrel.
5. Nig is a cat.
6. The squirrel is afraid of the hawk, the cat, and the boy with a gun.
7. Red lived in a wall. Red sat in the apple-tree.
8. The calf is afraid.
9. The turtle lives in a box.
10. The rabbit lives on the lookout.
11. The dog can not catch the squirrel.
12. Nig is black as ink.
13. There is sugar in the apple.
14. The apple-blossom is a rose.

(What other flower belongs to the rose-family?)



15. Nig knows the taste of the squirrel.
16. Does she know the taste of the apple? Why not?
17. *What flower* is this in the picture?

LESSON XXXVI.

PEGGY MEL.

Peggy Mel hive lives

Peggy

Mel

lives in a hive.

Peggy Mel lives in a hive.

TOPICS FOR DISCUSSION.

Mel means honey. Peggy Mel is the honey-bee. Difference between honey-bees and others. Queen-bee. Drone. Honey-bee or worker. How bees are kept by farmers. Why Peggy Mel stings. Independence in thinking is of more importance to the child than word-getting. Let the first consideration be the bee and her happiness, and her life and work. Words come themselves when the child is ready for words. *(See "An Idyl of the Honey-Bee,"* published by Houghton, Mifflin & Co.)

LESSON XXXVII.

THE BEE.

rude nest hole ground

The wild bee lives

in a rude nest or in a hole in the ground.

The wild bee lives in a nest.

TOPICS FOR DISCUSSION.

Wild bees. How do they live? Why in communities? The bee's love of order, diligence, thrift, economy. Her love of work. Use. The habits of bees that live in hives. It is not necessary that a child should learn each word that he sees the first time that he "goes through" a book any more than it is necessary that he should possess everything he sees when he enters a store. Let him take what he needs and as much or as little as he can assimilate. (See "An Idyl of the Honey-*Bee.*")

LESSON XXXVIII.

THE WILD BEE.

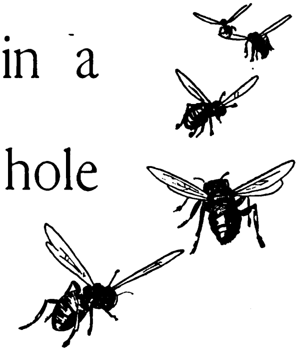
lives
builds
sacks
young

nest
stores
honey
hope

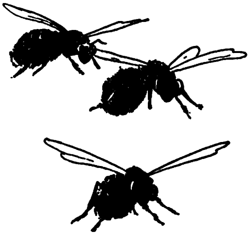
hole
little
one
rich

cells
deep
few
bee-bread

The wild bee lives in a
rude nest or in a hole
in the ground.

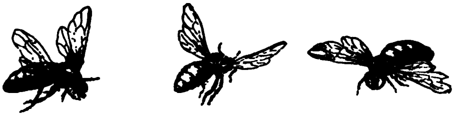


He builds a few deep cells
or sacks in which he
stores a little honey
and bee-bread for his young.



LESSON XXXIX.

PEGGY MEL.



Peggy Mel

lives in a hive.

She is a honey-bee.

Her one hope is

to be rich.

She is an honest citizen.

TOPICS FOR DISCUSSION.

Bees that swarm. Bees that live alone. Why Peggy Mel wants to be rich. Cells, how formed. Bees that make cells. Bees that bring home honey. Bee-bread.

"When you go to nature, bring us good science or else good literature, and not a *mere inventory* of what you have seen."

From the "Lovers of Nature."

LESSON XL.

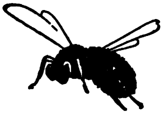
PEGGY MEL AND OTHER BEES.

one
day
smell
something
put
down
again
mad
load
rushed
gossip
off
that
after
let
said

One day Peggy Mel rushed into the hive.

She put down her load of

honey and then rushed



off again like mad.

"Oh, did you see that?" said a gossip. "Fee, fi, fo, fum! I smell something! Let's after!"

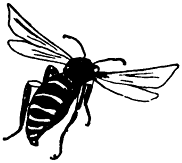
TOPICS FOR DISCUSSION.

She had found some apple blossom honey. The gossip of the bees. What they have to say to each other. How they say it. How honey is made. Wax. Use of the bee to *flowers, especially* clover. What flowers are adapted to honey-making. Why?

LESSON XLI.

mill bee the goes

The bee goes to mill.



He will have new bread now.

The bee goes to mill.

TOPICS FOR DISCUSSION.

What the author means by saying that the bee goes to mill. How millers look. Why their coats are dusty. Yellow pollen dust of flowers. What the bee does with the yellow dust. Bee-bread compared with the bread we eat. (See "The Pastoral Bee," published by Houghton, Mifflin & Co.)

Lesson in word-building on the blackboard.

Ill, mill, miller, fill, till, etc. Sentences containing the words dusty, coat, bee-*bread, miller, pollen-dust,* and other words, which will occur in the next lesson.

LESSON XLII.

THE BEE AT WORK.

home
goes
golden
maid
dairy
makes
grist
kicks
with
bread
head
then
packs
rams
where

The bee goes to mill.

He will have new bread now.

See his dusty coat! See the golden grist he brings home!

When a bee brings pollen into the hive he goes to the cell where he leaves it and kicks it off as a man kicks off his overalls or boots.

He makes one foot help the other. Then he walks off and never looks behind him.

Another bee comes along and rams it down with his head and packs it into the cells as a dairy maid packs butter in jars.

TOPICS FOR DISCUSSION.

The bee's mill. The yellow grist. Bee-bread. Relation of the bee and other *sects to the pollen-dust of the flower.* The bee's little "bread-basket."

LESSON XLIII.

THE BEE THAT LIVES IN A TREE.

buzzing
when
heart
first
blow
this
which
sharp
say
takes
come
they
home
loud
honey

A bee-tree has a heart of honey.

It takes a sharp eye to see a bee fly to the tree which is her home.

At the first blow of the ax the bees set up a loud buzzing.

When the other bees come to the tree they say, "Is this home?"

TOPICS FOR DISCUSSION.

The teacher cannot do better than to read to the children the entire extract in which the author describes the opening of the bee-tree. Remember that the underlying motive of this book is to develop the taste of the naturalist in the child and not to teach him reading for reading's sake merely. Let each child tell what he *thinks about the bee* which has lost its home, or give his personal interpretation of *what he has seen* among bees and other insects. (See "An Idyl of the Honey-Bee.")

LESSON XLIV.

A MILLION.

Nature makes
a million bees,
a million birds,
a million rats,
a million mice,

so nearly alike that
no· eye can tell
one from the other.

TOPICS FOR DISCUSSION.

It is not likely that a child has any idea of "a million," but he loves the large, the mysterious, the wonderful. The point is to have him judge and compare. Let him tell many things that are so extravagantly numerous that there is no such thing as numbering them. Let him give his own observations and reasons. Probably the bees and birds, *and rats, and* mice, know one from another. Why?

LESSON XLV.

LITTLE JOHN BULL.

English
sparrow
little
John
Bull
rowdy
sifts
dust
through
feathers

The English sparrow is a little John Bull.

He is a great rowdy.

He sifts dust through his feathers.

It is his way to keep clean.

It often happens that two sparrows try to get the same mate.

Then there is war.

TOPICS FOR DISCUSSION.

Why "John Bull" bathes in dust. Let the child tell whether or not he has observed the sparrow bathing in dust. In water. Comparisons with other birds. Why "John Bull" fights so much. How he happened to come to America. Of what use is he? Why he is not liked as well as the English lark or the canary. (*See "Love and War among* the Birds," Houghton, Mifflin & Co.)

LESSON XLVI.

THE SONGS OF BIRDS.

fife
sings
song
finch
robin
plays
war
without
love

What
is a bird
without its
song?

The finch plays the fife.

He sings of love but not of war.

The oven bird sings,

teacher, teacher, *teacher*, teacher, teacher!

TOPICS FOR DISCUSSION.

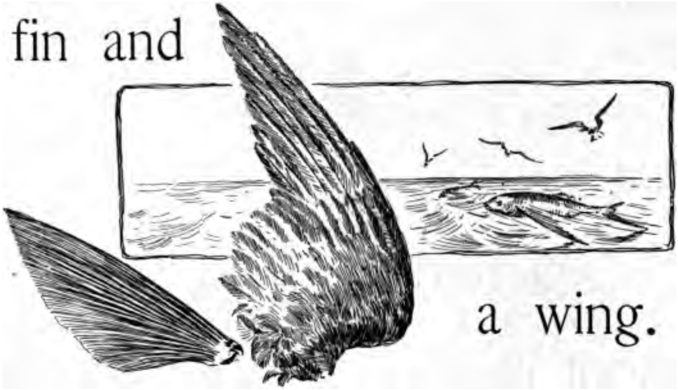
Let each pupil tell what he has heard a bird say. The object of the lesson is to arouse the child's mind to activity in making original observations. How many of us know five birds by their songs? When birds sing most heartily. Birds in spring. Early *morning*.

LESSON XLVII.

WINGS AND FINS.

fin   fish   wing   what   many

A fin and a wing.



How like a wing is a fin!

How a fish flies through the water!

TEACHER. Nature loves to make many things on the same plan.

TOPICS FOR DISCUSSION.

Analogies in nature. The fin is like the wing, how? Compare leaf with flower. How are they alike? Compare the horse's hoof with the hand in a mitten. Construction of a wing. Fin. Adaptation to different elements. Study of a bird from life. A fish. Compare several fishes.

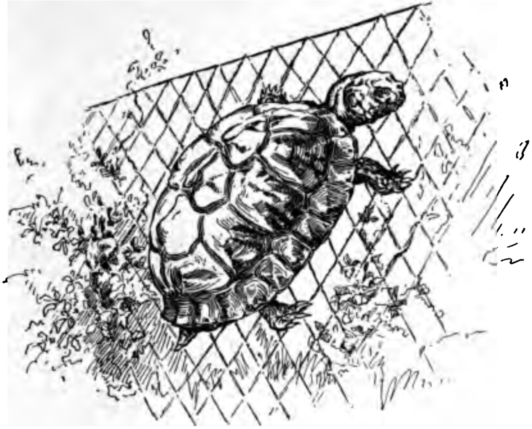
WORD-BUILDING.

ă	ĕ	ĭ	ŏ	ŭ	ā	ē	ī	ō	ū
ă-t	ĕ-t	ĭ-t	ŏ-n	ŭ-p	n-ā-m-e	m-ē	f-ī	r-ō-s-e	ū-s-e
c-a-t	l-e-t	s-i-t	n-o-t	c-u-p	s-a-m-e	b-e	f-i-n-e	n-o-s-e	m-u-s-e
r-a-t	p-e-t	b-i-t	g-o-t	s-u-p	d-a-m-e	h-e	m-i-n-e	g-o-es	S-u-s-y

ä	sh	ȳ	ng	ee	ĕ*a*	ou	ow	ck	a*i*
ȧ-h	sh-e	f-l-ȳ	i-n-g	b-ee	r-e*a*-d	ou-r	c-ow	t-i-ck	s-a*i*-l
f-a-t-h-e-r	sh-ee-p	m-y	s-i-n-g	t-r-ee	b-r-ea-d	ou-t	d-ow-n	s-t-i-ck	r-ai-n
w-h-a-t	*sh-i-p*	*s-l-y*	w-i-n-g	g-r-ee-n	th-r-ea-d	l-ou-d	t-ow-n	b-r-i-ck	l-ai-d

LESSON XLVIII.

A LETTER.



West Park, July 21, 1894.

Dear Ben:

I am glad to hear that your box-turtle can climb a wire fence. I have just found a bird's nest in my vines with a bunch of grapes in it. The grapes grew so fast that they got ahead of the bird and drove her out before she could hatch her eggs. Write again. I like boys.

Yours sincerely,

John Burroughs.

CONVERSATION.

How to *write a letter.* *Date.* Address. Body of the letter. Signature. Envelope.

LESSON XLIX.

WEEDS.

north
east
south
west
walk
they
ride
great
going
travelers
steal
swim
fly
tramps
hear

Weeds are great travelers.

They are tramps.

They are going east,

west, north, south.

They walk.

They fly. They swim.

They steal a ride.

TOPICS FOR DISCUSSION.

The weeds that grow near the school-house. How weeds fly? Seeds with wings. How birds carry seeds in the mud on their feet. How weeds send their seeds down stream. Why the author calls the weed a tramp. Compare weeds with other flowers. *Birds that live on* their seeds. (See "Notes by the Way," Houghton, Mifflin & Co.)

LESSON L.

WEEDS.

they
ground
above
under
lots
never
across
wind
rail
flood
heart
hear

Weeds go by rail, by flood,

by wind.

They go under ground.

They go above ground.

They cut across lots.

Weeds never lose heart.

TOPICS FOR DISCUSSION.

Weeds spreading underground. How they crowd other plants. Beauty of their flower. The *thistle.* The *pig*-weed. Daisies. Why safest by the roadside.

LESSON LI.

AUTUMN.

ragged
dusty
weeds
battles
fights
between
gipsy
blood

It is the time for tall weeds.

They love the road-side.

Here they are safe.

They are ragged and dusty tramps.

Spring fights her battles in the fall.

Gipsy blood can not stay between four walls and see such days go by.

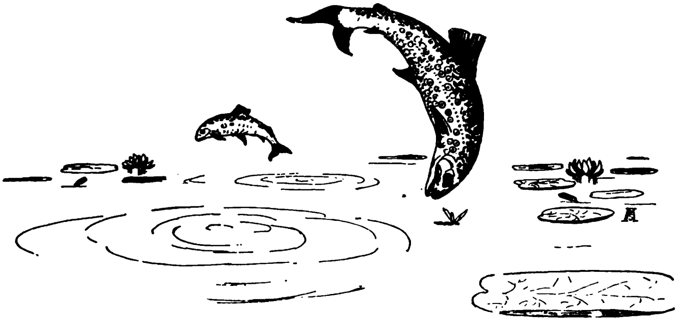
CONVERSATION.

The autumn months. Indian summer. The change of seasons. **Changes that** *come in autumn.* (*See* W. S. Jackman's "Child and Nature.")

LESSON LII.

THE TROUT.

fish
jumps
wild
water
is
of
trout
out



The trout is a wild fish.

He is nimble and swift.

He lives in
pure spring water.

He jumps out for flies.

CONVERSATION.

The habits of different fish. Size, form, color, food. Why the trout "is wild." Why they can live under water. The trout. Let the child give his own independent observations. (See "How to Go Fishing," Houghton, Mifflin & Co.)

LESSON LIII.

CATERPILLARS IN THE SNOW.

A VACANT mind, a preoccupied mind, an indifferent mind, sees little of what is transpiring about it. Love, interest, curiosity — it is these that sharpen the eye and ear and make the true observer. There is always something incalculable and unexpected in the life of nature about us.

One winter morning during a northeastern snowstorm I observed along the highway and about the fields numerous little brown worms or caterpillars crawling about on the snow. They were from a half inch to an inch in length. I had never seen the like before. The mercury stood at about freezing and the fresh fallen snow was six or seven inches in depth.

The worms moved very slowly, and so far as I could see, aimlessly. Where did they come from and what did they want? Judging from appearances merely, one would have said they were snowed down. If they were noticed by the country people, that was undoubtedly their inference. But in plowed fields and upon the river where the snow lay clear and smooth for miles upon the ice, there was not a worm to be seen. They were most abundant above old green sward, and near trees. Therefore it was certain that the storm did not bring them.

Over how large an extent of country they made their appearance I do not know, but next day in driving to town I saw a few of them still upon the snow five miles from where I first saw them.

They proved to be the larvae of a nocturnal moth, related to the army worm, with a long impossible name.

They had, of course, come out of the ground, or beneath the leaves or grass upon the ground, but for what purpose or from what cause is a mystery. There is no record of their having before been seen under such circumstances.

As night came on they buried themselves in the snow for better protection against the cold. A week or two later another snowstorm from the same quarter brought them out again in less numbers, but of increased size, and in March I observed a solitary specimen on the snow nearly two inches long. In the spring I expected a visitation from some strange moths that would make havoc with fruit or vegetation, but none such appeared.

The incident was interesting to me as showing what curious and unexpected *things are liable to turn* up at any time, if one has eyes to see them.

LESSON LIII.

QUEER CATERPILLARS.

storm bring snow little caterpillar

One morning in winter I saw many little caterpillars in the snow.

They were from a half inch to an inch in length.

I had never seen the like before.

They moved slowly.

The storm did not bring them.

Where did they come from?

What did they want?

CONVERSATION.

The caterpillar. Where it makes its winter home. Why the writer was surprised to find *these caterpillars in* the snow.

LESSON LIV.

QUEER CATERPILLARS.

snow
ground
slept
numbers
storm
queer
caterpillars
turning

At night the caterpillars made their bed in the snow.

They had come out of the ground and from under the leaves and grass.

They were in great numbers near trees.

Queer things are turning up all the time if one has eyes to see them.

NOTE. — Let the child study every phase of nature which presents itself. Seize on the "living present" as well as what is stored up in classified science.

JOHN BURROUGHS.

LESSON LV.

ICE.

crop
becomes
early
shaky
skates
sail
season
coverlid
sun-struck
ice-boat

The best crop of ice is an early crop.

Late in the season the ice is apt to get sun-struck. No sooner has a river pulled his icy coverlid over him than he begins to snore.

An ice-boat is a sail on skates.

TOPICS FOR DISCUSSION.

Formation of ice. Different forms of crystallization. Ice houses. The gathering of ice. The snoring of the river. Artificial ice. Uses of ice.

"Real observation begets warmth and joy in the mind. To see things as they lie about you and enumerate them is not observation; but to see the significant things, to seize the quick movement and gesture, to disentangle the threads of relation, to know the nerves that thrill from the cords that bind or the typical and vital from the commonplace and mechanical — that is to be an observer."

From the "Lovers of Nature."

LESSON LVI.

SALT.

Americans
deposited
among
pail
follows
saline
eager
gnaws
divide
smack

If you want to know how good salt is you must see a cow eat it. She gives the true saline smack.

How she dwells upon it! How she gnaws the grass and licks the stones where it has been deposited!

When the farm-boy takes a pail of salt to the fields the eager herds follow him.

They push their noses into the pail.

They give him no time to divide it.

We Americans are great eaters of salt.

But we must drink the salt air of the sea to get it at first hand.

TOPICS FOR DISCUSSION.

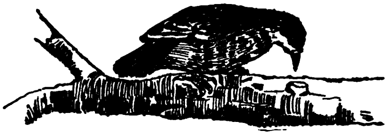
Crystallization. Salt crystals compared with ice crystals and sugar crystals. Why the sea is salty. Salt deposits or mines. Manufacture of salt. Relation of salt to health. Preserving quality of salt. Effect of salt on ice in melting it.

Madame Ragozin says that in Texas on the ranches they give their cattle large blocks of salt and that the cows come and stand in rows to lick it. She has seen a cow *teach her calf to love salt* by licking the block of salt and then licking the calf's nose.

LESSON LVII.

DRUMS AND DRUMMERS.

spring
utters
drum
drummer
sitting
ridge
barn
loud



In a higher Key.

The high-hole is a drummer.

He utters his long loud spring call, *whick* — *whick* — *whick* — whick, and then begins to rap with his beak.

I have seen him drum sitting on the ridge of a barn.

CONVERSATION.

The noises made by birds. What they use as drums. How they drum with their wings. (See Story of Prince Red Cap in "Stories from Plato and other Classic Writers," Ginn & Co.)

Note. This lesson is adapted from "Winter Neighbors," an essay in which are many stories which could hardly fail to create habits of observation in the child.

LESSON LVIII.

DRUMS AND DRUMMERS.

(Continued.)

once
would
knot
shift
hour
high
position
wood-pecker
limb
inch
stub
wished

I once saw a wood-pecker at his drum.
He would drum for an hour at a time.
His drum was the stub of a dry limb.
How fast his head would go when drumming!
When he wished to change the key, he would shift his position an inch or two to a knot, which gave a high shrill note.
When I climbed up to see his drum, the bird was much put out.
He flew at me with a sharp note to ask what my business was with his drum.
The wood-pecker was drumming for a mate. After drumming some weeks *his mate* came.

LESSON LIX.

LIFE UNDER A STONE.

stone
roof
proof
cells
found
makes
good
better
lone
water
fire
field

A stone makes a good roof.

It is water-proof and fire-proof.

The field-mouse wants no better place to nest than under a large, flat stone.

I found the nest of a lone bee under a stone. It had four cells.

TOPICS FOR DISCUSSION.

Creatures that live under stones. Little David tells me that he has found a beetle under a stone which "makes smoke" when discovered. The explosive beetle. What have you found under a stone? Mice. Ants. Worms. Bugs. Bees. Lizards. Frogs. Compare with animals that live in dry places. (See *A Lone Queen* in "Notes by the Way," Houghton, Mifflin & Co.)

LESSON LX.

BUDS.

April
bud
budding
swell
swelling
food
fancy
eye
begin

April is the
time to go
budding.
A swelling bud is food
for the fancy
and food for the eye.

Some buds begin to glow
as soon as they begin to swell.

TOPICS FOR DISCUSSION.

Spring buds. Winter buds. Have the children found any winter buds? Leaf buds. Flower buds. What is the difference between the two? Are buds green or pink? Scales. Use of bud scales. The "varnish" secreted by buds. Its use. Little David brought me some cherry, apple, and chestnut branches in January and they have blossomed out in winter. (See "A Spring Relish," Houghton, *Mifflin & Co.)*

LESSON LXI.

BUDS.

scales
color
change
brought
become
delicate
pink
into
flush
effort
keep
glow
sweat
pretty
their
many

REVIEW.

April is the time to go budding.

A swelling bud is food for the fancy and food for the eye.

Some buds begin to glow as soon as they begin to swell.

The bud scales change color and become a delicate pink.

They blush as if the effort to "keep in" brought the blood into their faces.

Many buds begin to sweat as well as to glow.

CONVERSATION.

Why artists like to paint "spring scenes." Odor of buds. Why they are sticky. Let the child report his own observations of buds he has seen at any time.

LESSON LXII.

A COLD LUNCH.

"The north wind doth blow,
And we shall have snow,
And what will the robin do then?
Poor thing!"

winter
snows
three
months
crows
else
frozen
green
porch
filched
bones
which
worse
flesh
depend
there

It was a cold winter.

There were deep snows for three months.

The fox ate frozen apples.

The crows had little else than frozen apples for three weeks.

CONVERSATION.

Birds in winter. Where they go. How, they get along when they stay where the *snows are deep.* (*See* "Hard Fare," Houghton, Mifflin & Co.)

LESSON LXIII.

A COLD LUNCH.

(*Continued.*)

lost
these
neighbor's
cinders
chestnuts
here
stolen
ash-heap
carry
knot
wanted
except
hunter
told
gizzards
found

They grew bold and came to my porch and filched bones which Lark the dog had left.

The jays had a worse time than the crows.

They do not eat flesh or fish.

They depend upon nuts.

A troop of them came to my ash-
one morning. They found
except cinders for their gizzards

May be that was what they wante

They had stolen corn all winter
my neighbor's corn-crib.

An old hunter told me he had seen
hide nuts in a knot-hole in a t

I have seen jays carry off ches
and hide them here and there
the ground.

When the snows come these nuts
lost to them.

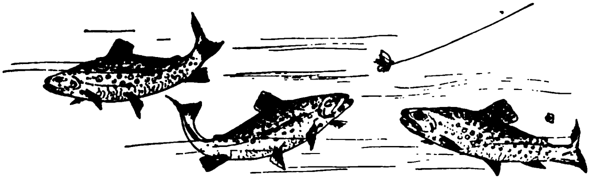
CONVERSATION.

Getting cinders for their gizzards. What use has the bird for cinders? *ison of methods of* digesting food, — the cow with her stomachs, — the *method of eating* and digesting, — process of mastication and so forth.

LESSON LXIV.

A REVIEW.

What does sunshine do to the apple?
What flower is like the rose?
What lives in an old tree?
Where does the wild bee live?
What does the bee do with pollen-dust?



What is a weed?
Why does the wood-pecker drum?
What lives under a stone?
When do buds come?
What do birds say?
What do birds eat in the winter?
Where does the fish lay its eggs?
What can you see in the picture?

LESSON LXV.

ON FOOT.

carried
shoe
golden
never
stare
frost
proud
something

How we stare at a big foot!

We are proud of a small foot in a fine shoe.

A little foot never yet carried a great man.

The man who goes on foot has a warm heart. He does not look down on anybody. He is not asleep.

He knows the ground. Wind, frost, rain, heat, cold, are something to him.

The apples by the roadside are his. Each step brings him the golden age.

CONVERSATION.

Mr. Jackman in his "Nature Study" recommends the study of the human body in primary grades. His experiments are usually conducted by comparison with the bodies of other animals. Human foot compared with foot of horse, dog, cat, bear, bird, and so on. The right of the body to exercise, to loose clothing, to good care. The beauty of the body if left to its natural development. The real meaning of the lesson. The beauty of freedom. The democratic spirit of the true American. The vulgarity of showy externalities. (See "City Life.")

LESSON LXVI.

A COON HUNT.

night
drives
while
coon
stones
comes
green
search
kernels
husks
field
hear

The coon comes out at night. He eats corn. While the corn is yet green he pulls the ears down like a hog.

He tears open the husks and eats the tender kernels.

The coon-dog steals through the cornfield in search of him.

The coon pricks up his ears and runs
to a stone wall. Hear the stones
rattle!

If the dog does not find him he comes
back and says, "No coon there!"

If he does find him he drives him up
a tree. Then there is a pell mell
rush to the tree.

The first thing now is to make a fire.

Then you sit all night at the foot of
the tree.

CONVERSATION.

The animals that are called "nocturnal." Why some animals come out at night. Owls. Bats. Rats. Insects. Night-hawks. The coon. Where he lives. The children in city schools know very little of animals except as they see them in parks and menageries. Of the wild, happy creatures that live in the woods and fields they know almost nothing,—the animals that help to make country life what it is in America. If possible, take the children to the woods in the early autumn or spring and let them see whatever may chance to come in their way of these native animals.

LESSON LXVII.

NOVEMBER.

turtles
flies
toads
Rip Van Winkle
themselves
until
lain
their
crickets
winter
ready
getting
spiders
stream
black
down

The Rip Van Winkles have lain down for their naps.

The toads and turtles have buried themselves.

The skunk is in his hole.

The black bear will wait until the sno
comes.

He does not like the looks of his bi
tracks in the snow.

The ants, bees, crickets, spiders, an
flies are getting ready for thei
winter's nap.

But the fish go up stream to la
eggs.

CONVERSATION.

The story of Rip Van Winkle. (See Irving's "Sketch Book," Ginn & Co.) of Proserpine and her long winter's sleep. How the butterfly sleeps all Cocoons. How the bear hibernates. The turtle. Why? Other hibernating cre

"The secret of observing nature is first a love of her work; and second, a ness and intentness of the mind in one direction. The mind must be like a s plate quick to receive impressions. The eye does not always see what is in it. Indeed it might almost be said, it sees only what is back of it, in the mir

From "Observations of Na

LESSON XLVIII.

TWO ROBBERS.

pockets chipmunk berries bob-tailed

As I stopped to drink at a brook one day a chipmunk set himself on the rim of my cup to eat my berries.

He ate two and then began to fill his pockets.

Two, four, six, eight!

His cheeks swelled out.

But all the time he kept on eating as if not a moment was to be lost.

Then he went off and told a friend, and in a minute a bob-tailed chip came and began to load up.

But I had now got tired of the joke and moved off.

TOPICS FOR DISCUSSION.

The chipmunk. His habits, food, house, and so on.

LESSON LXIX.

A CHIPMUNK.

clasped
suddenly
arrow
fore
shrike
looked
paws
morning
rushed
steal
fingers
breast

Once a chipmunk went out to steal corn.

He saw me. He sat up to look at me. He clasped his forepaws over his breast as if they had been hands and the tips of his fingers were in his vest pockets.

Suddenly he turned tail and rushed for his hole. A shrike shot like an arrow at the hole and looked in. The chipmunk stole no corn that morning.

CONVERSATION.

Birds of prey. The shrike. The difficulty with which small animals gather food. Let each child tell what he has seen in the way of animals capturing their food.

LESSON LXX.

STRAWBERRIES.

field
taste
lining
daily
bobolink
season
heart
food

Oh, the strawberry days! How they come back!

When I was a lad and went to the fields with my hoe or a cow in the strawberry season, I was sure to come back at meal-time with a lining of strawberries in my hat.

They were my daily food. I could taste the song of the bobolink in them.

The strawberry is a little human heart.

CONVERSATION.

Berries. Difference between berry and nut. How the berry grows. Size. Color, *shape, use. (See essay* "The Strawberry.")

LESSON LXXI.

ROOTS.

rob	rain	how	big
carry	earth	among	battles

Trees carry their wars deep into the earth.

There are hot battles among the roots.

How the big tree robs the little one.

The big tree gets all of the rain.

CONVERSATION.

The battles of roots. How they push each other to take up the rain. How the roots feed plants and trees. Why the farmers hoe out the weeds on cornfields in gardens. Rain, — what it does for plants, flowers, and so on. (See "Is it Going to Rain?" Houghton, Mifflin & Co.)

LESSON LXXII.

RAIN.

going world robin laugh

Is it going to rain?

Rain is life to the grass.

How the buds swell!

Hear the Robin laugh!

The moon has sunshine, but it has no rain, hence it is a dead world.

TOPICS FOR DISCUSSION.

Effect of sunshine on life. Effect of rain on life. Would sunshine alone make the plants grow? Why the moon has no rain. Has it sunshine? Has it light? Has it an atmosphere? If you were on the moon would it be light or dark? Can there be light and no atmosphere? The moon gives back or reflects its sunshine but *cannot use it. Why?* The use of motes in the air.

LESSON LXXIII.

THUNDER.

clap shake clouds thunder

How a clap of
thunder will shake
down the rain!

It gives the clouds
a smart rap.

It makes the drops let go.

TOPICS FOR DISCUSSION.

What thunder really is. Lightning. Tell the story of Jupiter and the theory of people in ancient times. Effect of thunder on liquids — driving particles together. Effect on milk. Lightning rods. Safe places during thunder storms. Franklin and his experiments in electricity.

LESSON LXXIV.

A STORM.

exploded bomb-shell beaten

Out in the woods!

A black sky!

The lake was a pool of ink.

Little puffs of wind began to steal in and tease our fire.

Soon a bomb-shell exploded in the tree-tops over our heads.

The air was full of water.

The fire was beaten down.

TOPICS FOR DISCUSSION.

The coming of a storm. How it looks at a distance. "See it walk across the field." Storms that move straight ahead. Storms that whirl. Use of storms. Storms that rage on the surface of the sun.

PART II.

SHAM NESTS.

(The teacher's page.)

ANY people have seen the marsh wren, without suspecting at all its cunning habits of nest-building. Last summer while rowing with some friends on the met River near the southern end of Lake Michigan, my attention was attracted umbers of these birds in the marshes on either side; a little russet bird with a h song sometimes delivered on the wing as it hovered for a moment above the e marsh grass, or else uttered while at rest amid the sedges. Let us find the , I said, for it has a curious habit of building a little village of nests only one of h it occupies. As we rowed slowly along near the edge of the marsh we scanned tall grass for the signs. Several times we thought we had discovered it, but disappointed till finally, some denser spots than usual attracting our attention, pushed the boat a few yards into the marsh, and there were the cunning little ctures woven into the grass a foot or more above the sluggish water; not one ely, but five or six of them, only a few feet apart.

Only one of the nests was real, all the rest were sham nests, the result apparently he mere bubbling over and superabundance of the domestic instinct on the part he male. He was such a happy and whole-hearted husband and father that he ld doubtless have filled all these structures with his progeny. Or was it a rude npt at concealing the genuine nest, by surrounding it with so many sham nests? first, second, and third we tried were counterfeits; then a structure a little more rate than the others, with a little dry grass showing in it, was examined, and d to hold the eggs. One could just feel them by pressing the finger into the opening at the side. The sham nests were all built by pulling down the blades e grass that grew on the spot and weaving them together; the genuine nest was in the same way with a little extra material in the way of dry grass, added.

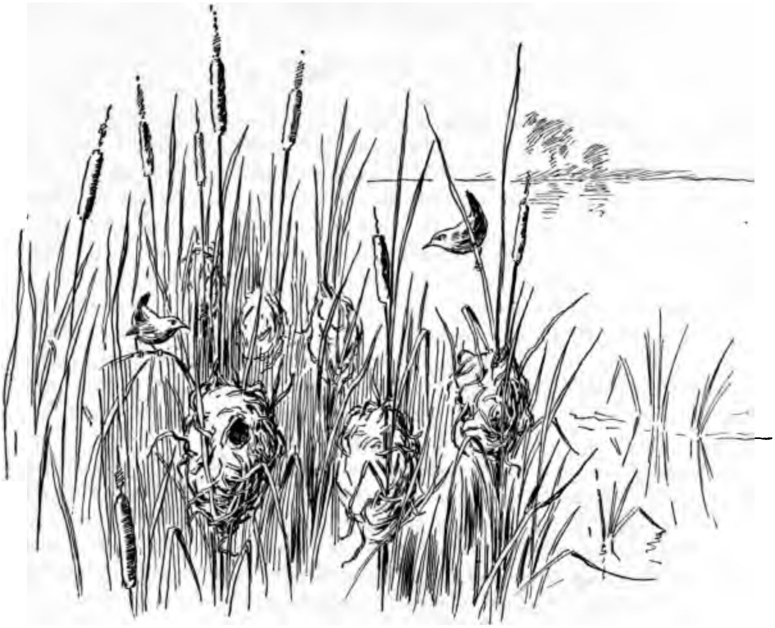
NOTE TO THE TEACHER.

have repeatedly tried the experiment with children of reading along from such s as the one given, allowing the pupils to do the reading when we came to easy In this way they would do most of the work.

EDITOR.

SHAM NESTS.

(A page for the children.)



The marsh wren has a cunning habit.
He builds five or six nests a few feet
apart. Only one of the nests is real.
All the rest are sham nests.
How are the sham nests built?

CONVERSATION.

Different methods of building nests. Instinct of self-protection.

THE SONG-BIRD AND THE COW-BIRD.

"The little bird sits at his door in the sun." — LOWELL.

The song-birds nearly all build low.

Their cradle is not in the tree-top.

The cow-bird finds a song-bird's nest and drops her own egg in it.

There is no doubt that in many cases she removes one or two eggs to make room for her own.

The young of the cow-bird is large and hoggish.

CONVERSATION.

Why the cow-bird is so called. Comparison between parisitical birds and plants. Why the cow-bird steals into other birds' nests. Greediness and laziness. Why the cow-bird is shunned by other birds. (See "Tragedies of the Nest," from which this lesson *is adapted, Houghton,* Mifflin & Co.)

THE COW.

(Adapted from "Farm Life.")

There is virtue in the cow. She is full of goodness. The cow is the true pathfinder and pathmaker.

Follow her through the woods and you have the best road. How she beats down the brush and wears away even the roots of the trees.

My grandfather went out one night to look up a missing cow when he heard something in the brush and out stepped a bear into the path before him.

The cow is one of the most delightful feeders among animals.

It makes one's mouth water to see her eat pumpkins, and to see her at a pile of apples is distracting.

CONVERSATION.

The cow as a pathfinder. Story of Boston and its streets. (See "A Farm Life.")

THE BIRCH TREE.

hen the pine tree goes the birch comes.

giant goes but a man comes in his place.

he birch is a stay-at-home tree.

is a tent, a roof, a boat, a cup, a plate; it gives you spoons, paper for letters, candles and fuel.

sk it for a coat and it gives you a waistcoat also.

hen it rained we had a birch-bark umbrella. When we came to a stream we drank from a birch-bark cup.

ater never tasted so sweet. The cup just fits the mouth. It makes me thirsty now to think of it.

CONVERSATION.

Hiawatha and his birch canoe. See Longfellow's "Hiawatha." "Give me of r bark, Oh Birch-Tree." Why the birch is so useful. Birch-bark is so common the pupils can easily make a nature study from the object and compare with the of other trees. (See *A Taste of Maine Birch* in "Signs and Seasons," Houghton, *flin & Co.)*

AS SNUG AS A BUG.

I found a little frog in a bed of frozen leaves where he had slept all winter.

He was not frozen but his joints were stiff.

Young crickets and ants are found in frozen ground in the winter, but their bodies contain no frost.

Young creatures have warm blood.

Their winter homes are snug.

The grub has a snug home in the bark of a tree.

The bird raps at his door in spring.

A young man told this story: "I sat at my drawing-board making a sketch when I took an apple from my *pocket* and cut it in two.

An apple-worm fell upon the drawing-board and started at once for the edge of the board.

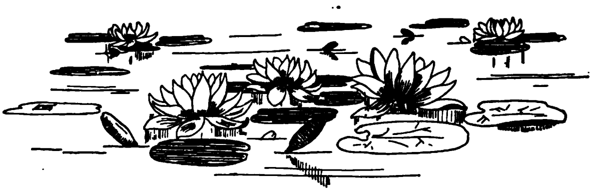
t crawled over and went into a hole which some other worm had eaten there long before, when the board was yet a part of a tree.

n a short time a thin silky web was spread like a veil over the door of the hole."

CONVERSATION.

How did the worm know that the hole was there? Cocoons. Metamorphoses sects. Security of animals in their winter quarters. Let each pupil tell what al he has found in its winter home under leaves, stones, in the mud, or beneath bark of trees.

THE POND LILY.



See the pond lily with her golden heart open to the sun.

She rocks on the water.

What a queenly flower! She is the type of purity and sweetness.

Its root, like a black, ugly reptile, clings to the slime, but the flower is like a star.

The closed bud makes its way up through the water to meet the sun, and after its brief life it closes itself up again and slowly buries *itself* beneath the dark wave.

ne almost fancies a sad, regretful look in it as the stem draws it downward to mature its seed on the sunless bottom.

e pond lily is a flower of the morning. It closes a little after noon.

you pluck it and carry it home, it still feels the call of the morning sun, and will open to him if you give it a good chance.

il their stems up in the grass on the lawn, where the sun's rays can reach them, and sprinkle them well.

y the time you are ready for your morning walk, there they sit upon the grass, almost as charmingly as upon the wave.

From *The Century Magazine.*

CONVERSATION.

he pond lily. Its flower. Petals how different from petals of other lilies. leaf. Size. Color. Habits.

MARCH.

March came in like a lamb.
The sun poured himself into the earth as into a cup.
The frogs left their eggs in the pools.
The sound of the axe rang through the woods.
Ah, I am there now!
I smell the dry leaves!
The world is full of sap!

I see the huge kettles boil and foam!
I dip the sap into them!
I tend them all day.
I would like to make sugar every day the
whole year round.
March went out like a lamb.

CONVERSATION.

March, the stormy month. March the month of Mars. What the farmer does in March. Sugar making.

WHIP-POOR-WILL.

One day in May I came upon the nest of a whip-poor-will in the woods.

The nest is not a real nest.

There were two eggs on some dry leaves.

When my foot was near the nest the mother bird flew away.

After the young birds are hatched, all of the wit of the mother comes into play.

She fans the leaves so that they hide the nest.

The whip-poor-will walks like a man in a bag.

CONVERSATION.

Is the whip-poor-will a common bird? Have you heard a whip-poor-will sing? His song. His color. Habits. Why the mother fans leaves when she springs into *the air. Methods* of protecting the young adopted by different birds. Awkwardness *of the whip-poor-will.* (See "Sharp Eyes," Houghton, Mifflin & Co.)

A friend ls me these s about a high-hole.

e says:

e high-hole never eats anything that e can not pick up with his tongue.

At least that was the case with a young one I took from the nest and tamed.

He never used his beak.

He would search everything with his tongue from a nail-hole to a kitten's eye.

I took the bird and the cat on my knee so that they would become friends.

The high-hole thrust his tongue at the cat's eye and she ran away.

The high-hole will not eat a grasshopper.

His 'best hold' is ants.

I would dig up an ant-hill for him and he would lick up the ants."

CONVERSATION.

Friendliness between the man and the bird. Is it possible for people and animals to be friends? Is it better for them to be friends? How many birds are sacrificed yearly for trimming hats! (See Mr. Gannett's poem on killing birds for hat trimmings.) Did the high-hole hurt the cat? Why did the high-hole use his tongue instead of *his beak?*

AS SILLY AS A LOON.

The loon has red eyes and a black head.

He has a doleful cry at night and a strange laugh by day.

The loon does not look like a silly bird unless you see him stuffed and in a collection.

There he looks like a goose.

Nature never meant him to stand up or to use his legs or feet except for swimming.

The loon can catch a large fish but he can not eat it under water.

I once saw a man eat a cake under water.

CONVERSATION.

Why is the loon generally called "silly"? Habits of swimming birds. Web-*footed animals.*

BIRDS THAT LOOK IN LOOKING-GLASSES.

A western writer tells me that she knew an interesting case of a rooster that was highly enraged at his own image in a looking-glass.

"A little girl had been stationed to watch a large mirror which was left in the yard previous to moving into another house.

A rooster seeing himself in the glass imagined a rival near and rushed upon him.

The little girl tried to put him to *flight, but* he ran about in a circle and came back to the enemy, pouncing upon him in a new attack. The child chased him to the rear of the house when he eluded her, ran entirely around the house, and flew at the mirror, breaking it to pieces."

The same correspondent writes me that she once put a looking-glass down on the floor in front of the canary-bird's cage. The poor canary had not had any communion with his own kind for years.

He used often to watch the ugly sparrows — the little plebeians — from his aristocratic gilded palace. I opened his cage and he walked up to the looking-glass and it was not long before he made up his mind.

He collected dead leaves from the house plants, twigs, bits of paper and all sorts of stray bits and began a nest right off. Several days after in his lonely cage he would take bits of straw and arrange them when they were given him."

I thought what different emotions this bird's reflected image awoke in its little breast from those aroused in a male bluebird last summer that so disturbed the sleep of my hired man in the early morning.

The bird with its mate had a nest in a box near by the house, and after the manner of the blue-birds was very inquisitive and saucy about the windows. One morning it chanced to discover its reflected image in the windows of the hired man's room. The shade, of some dark stuff, was down on the inside, which aided in making a kind of looking-glass of the window.

Instantly the bird began an assault upon the supposed rival in the window and made such a clattering that there was no more sleep inside that room.

Morning after morning the bird kept this up, till the tired plowman complained bitterly, and declared his intention to kill the bird. In a lucky moment I suggested that he leave the shade up and try the effect. He did so and his morning sleep was thenceforth undisturbed.

WHO BROKE THE EGG?

The young bird breaks its own shell with a little drill on the top of its beak.

The drill is a small scale which falls off.

The shell is composed of lime which is decomposed by carbonic acid gas.

The gas eats the shell and makes it very brittle.

Hence the ease with which young birds free themselves.

CONVERSATION.

The ways young animals have of helping themselves. How little ones are protected. *The bird, kangaroo,* mouse, bee, etc. Helpfulness. Self-helpfulness.

PART III.

FOR THE TEACHER.

A MEAN BIRD.

How many curious little incidents in the lives of the birds are happening all about us which we do not see, or, if seeing, do not understand.

Walking along a path the other day, I saw a bird's egg, that of a chippie, lying upon the ground. It was fresh and had probably been dropped there but an hour or two before. It had two small holes in it about one-quarter of an inch apart, which puzzled me. What made these holes, and how came the egg to be placed there upon the ground so carefully as not to break it?

A few days after a little incident came under my observation that threw light upon the stray egg.

I was sitting in my summer-house o June day when I chanced to see a co bird fly out from the branches of t maple above me and go down to t ground among the grape vines below with something in her beak. The bi alighted upon the ground and remain motionless. I kept my eye upon h Presently she lay down her burden a stepped along a foot or two. S seemed watching to see if she was h self watched.

I went down to see what she h deposited there so stealthily. It prov to be the freshly laid egg of the red-ey vireo. It was yet warm and was pu tured with two holes, like the egg of t chippie I had found.

I had suspected there was a nest *the vireo* in the maple above me and h searched for it several times without success. Not half an hour before I witnessed the incident of the cowbird I had seen the two vireos leave the tree and fly with a peculiarly happy air down the hill toward a little maple grove. They went as if hand and hand like two children. The female had probably just deposited an egg in the nest, and the happy couple were off for a midday lunch together.

The cowbird was probably on the watch somewhere, and stole to the nest the moment the owners were away. The newly-laid egg she seized and bore away, preparatory to putting one of her own in ts place.

I renewed my search for the nest. I scrutinized the branches from every possible standpoint. Presently I stepped a yard down the bank, shot my eye along a little tunnel in the dense foliage, and there it was — a little gray mass far out toward the end of an inaccessible branch.

Unless I planted my foot on a particular spot of ground and inclined my body at just such an angle the nest could not be seen. As the nest could not be reached, I could not complete the observation.

From time to time, for a week or more, I saw the parent bird sitting; but some mishap must have befallen the nest, as no young vireos were ever seen or heard in the tree, and the old birds disappeared.

In the fall I cut off the branch that held the nest to see whether or not the birds had buried the egg of the cowbird *in the bottom*, but it was not there.

The little summer yellow bird will frequently get rid of the strange egg in this way. I have heard of a nest being carried up three stories, so to speak, for this purpose, two strange eggs being successively buried in the bottom.

The red-eye is very often the victim of this trick of the cowbird. Hardly a summer passes that I do not see this little trim, ash-colored bird pursued by its large, dusky, greedy bantling.

It is my opinion that the cowbird usually removes an egg from the nest in which it designs placing its own. It has been seen to remove a wren's egg from the nest, the little owners following it and scolding as only wrens can.

The birds that fall a victim to the cowbird in this way never seem to suspect that this dusky creature is their enemy.

I have never seen them show the least sign of hostility toward it. The robins and nearly all the orchard birds will mob the jay, because they know the jay to be an egg-sucker. So will the robins hustle a red squirrel out of the tree that holds their nest, but I doubt if any of the birds suspect that the cowbunting victimizes them in the way it does.

It is a trick cleverly managed. The bird watches its opportunity; it does not disturb the other eggs except to remove one to make room for its own. The success of its little plan is frustrated if it blunders in any way so as to excite the suspicions of the owner of the nest. The only blunder it ever does *make is to* drop its eggs too soon, or before the nest contains other eggs. I say drop; the bunting probably takes but a fraction of the time to deposit its egg that other birds do. I have never yet heard of one being seen on the nest.

It seems to know, too, that if its egg is once hatched the rightful occupants stand but a poor show. What a terrible tragedy this would be if it could be repeated in the human sphere; a strange baby in the cradle, which rapidly grows to unusual dimensions and gradually causes the death of all the other children by devouring all the food the parents bring, the latter under some spell which prevents them from seeing what is taking place!

The cow-bunting is among the early arrivals in the spring, usually reaching New York and New England by the middle of March. Its musical talent is not great, yet its peculiar vitreous notes are pleasing. The manner of their delivery is interesting. It looks as if they must be formed in the bird's crop and it expelled them with much effort and labor. They are not the least bit lingual. The songster puffs himself up and wrenches out the notes with a kind of guttural spasm. Yet they have a sweet-ringing cadence.

In midsummer the young leave their foster-parents and begin to collect in small flock, and in September move southward.

NOTE.

In this essay it is not likely that the child can read more than two or three of the easiest paragraphs. Also in the essays following — a sentence now and then is all that can be expected. But they can "find words" in review and discuss the subject matter.

EGG-SHELLS AND YOUNG BIRDS.

In May two boys in town wrote to me to explain to them the meaning of the egg-shells, mostly those of robins, that were to be seen lying about on the ground here and there. I supposed every boy knew where most of these egg-shells came from. As soon as the young birds are out, the mother bird removes the fragments .of shells from the nest, carrying them in her beak some distance, and dropping them here and there. All our song birds, so far as I know, do this.

Sometimes, however, these shells are dropped by blue-jays after their contents have been swallowed. The jay will seize a robin's egg by thrusting his beak into it, and hurry off lest he be caught in the act by the owner. At a safe distance he will devour the contents at his leisure, and drop the shell.

The robins, however, have more than once caught the jay in the act. He has the reputation among them of being a sneak thief. Many and many a time during the nesting season you may see a lot of robins mob a jay.

The jay comes slyly prowling through the trees, looking for his favorite morsel, when he is discovered by a vigilant robin, who instantly rushes at him crying, "Thief! thief!" at the top of his voice. All the robins that have nests within hearing gather to the spot and join in the pursuit of the jay, screaming and scolding.

The jay is hustled out of the tree in a hurry, and goes sneaking away with the robins at his heels. He is usually silent, like other thieves, but sometimes the birds make it so hot for him that he screams in anger and disgust.

Of the smaller birds, like the vireos and warblers, the jay will devour the young.

My little boy one day saw a jay sitting beside a nest in a tree, probably that of the red-eyed vireo, and coolly swallowing the just-hatched young, while the parent birds were powerless to prevent him. They flew at him and snapped their beaks in his face, but he heeded them not. A robin would have knocked him off his feet at her first dive.

The belief prevails more or less that when the eggs of a bird are ready to hatch, the shell is broken by the mother bird. Even Bryant puts this notion into one of his poems:

The mother bird hath broken for her brood
Their prison shell, or shoved them from the nest,
Plumed for their earliest flight.

But the notion is erroneous. The young bird breaks its own prison shell, which becomes very brittle at the last. It would be a very risky procedure to aid the young bird in this matter. The struggle to free itself from the shell seems all-important.

I once met a gentleman on the train who told me about a brood of quails that had hatched out under his observation. He was convinced that the mother-quail had broken the shells for the young birds. He sent me one of the shells to convince me that it had been broken from the outside.

At first glance it did appear so. It *had been* cut around near the large end, with the exception of a small space, as if by regular thrusts or taps from a bird's beak, so that this end opened like the lid of a box on a hinge, and let the imprisoned bird escape. What convinced the gentleman that the force had been applied from the outside was that the edges of the cut or break were bent in.

If we wish rightly to interpret nature, to get at the exact truth of her ways and doings, we must cultivate what is called the critical habit of mind; that is, the habit of mind that does not rest with mere appearances. One must sift the evidence, must cross-question the facts. This gentleman was a lawyer, but he laid aside the cunning of his craft in dealing with this question of these egg-shells.

The bending in, or the indented appearance of the edge of the shells was owing to the fact that the thin, paper-like skin that lines the interior of the shell had dried and shrunken, and had thus drawn the edges of the shell inward. The cut was made by the beak of the young bird, probably by turning its head from right to left; one little point it could not reach, and this formed the hinge of the lid I have spoken of.

Is it at all probable that if the mother bird had done this work she would have left this hinge, and left it upon every egg, since the hinge was of no use? The complete removal of the cap would have been just as well.

Neither is it true that the parent bird shoves its young from the nest when they are ready to fly, unless it be in the case of doves and pigeons. Our small birds *certainly* do not do this. The young birds will launch out of their own motion as soon as their wings will sustain them, and sometimes before.

There is usually one of the brood a little more forward than its mates, and this one is the first to venture forth. In the case of the bluebird, chickadee, high-hole, nut-hatch and others, the young are usually a day or two in leaving the nest.

The past season I was much interested in seeing a brood of chickadees, reared on my premises, venture upon their first flight. Their heads had been seen at the door of their dwelling—a cavity in the limb of a pear-tree—at intervals for two or three days.

Evidently they liked the looks of the great outside world; and one evening, just before sundown, one of them came forth. His first flight was of several yards to a locust, where he alighted upon an inner branch, and after some chirping and calling proceeded to arrange his plumage, and compose himself for the night.

I watched him till it was nearly dark. He did not appear at all afraid there alone in the tree, but put his head under his wing and settled down for the night as if it was just what he had always been doing. There was a heavy shower a few hours later, but in the morning he was there upon his perch in good spirits.

I happened to be passing in the morning when another one came out. He hopped out upon a limb, shook himself, and chirped and called loudly. After some moments an idea seemed to strike him. His attitude changed, his form *straightened* up, and a thrill of excitement seemed to run through him. I knew what it all meant; something had whispered to the bird, "Fly!" With a spring and a cry he was in the air, and made good headway to a near hemlock.

Others left in a similar manner during that day and the next, till all were out.

Some birds seem to scatter as soon as they are out of the nest. With others the family keeps together the greater part of the season. Among birds that have this trait may be named the chickadee, the bluebirds, the nut-hatch, the king-bird, the phœbe-bird, and others of the true fly-catchers.

One frequently sees the young of the phœbe sitting in a row upon a limb, while the parents feed them in regular order. Twice I have come upon a brood of young but fully fledged screech-owls in a dense hemlock wood, sitting close together upon a low branch. They stood there like a row of mummies, the yellow curtains of their eyes drawn together to a mere crack, till they saw themselves discovered.

Then they all changed their attitudes as if an electric current had passed through the branch upon which they sat. Leaning this way and that, they stared at me like frightened cats till the mother took flight, when the young followed.

CRADLES OF THE BIRDS.

THE other day I was walking in the silent, naked April wood when I said to myself, "There is nothing in the woods."

I sat down upon a rock. Then I lifted up my eyes and beheld a newly-constructed crow's nest in a hemlock tree near by. The nest was but little above the level of the top of a ledge of rocks only a few yards away that crowned the rim of the valley.

But it was placed behind the stem of the tree from the rocks, so as to be secure from observation on that side. The crow evidently knew what she was about. Presently I heard what appeared to be the voice of a young crow in the tree tops not far off. This I knew to be the voice of the female and that she was being fed by the male. She was probably laying, or about beginning to lay eggs in the nest.

Crows, as well as most of our smaller birds, always go through the rehearsal of this act of the parent feeding the young many times while the young are yet a long way in the future. The mother bird seems timid and babyish, and both in voice and manner assumes the character of a young fledgeling. The male brings the food and seems *more than usually* solicitous about her welfare.

When the young do come the female is usually more active in feeding them than the male. Among the birds of prey, like hawks and eagles, the female is the larger and more powerful, and therefore better able to defend and to care for her young. Among all animals, the affection of the mother for her offspring seems to be greater than that of her mate, though among the birds, the male sometimes shows a superabundance of paternal regard that takes in the young of other species. Thus a correspondent sends me this curious incident of a male bluebird and some young vireos:

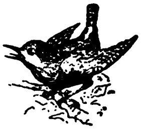
A Snake Skin for Lining.

A pair of bluebirds were rearing their second brood in a box on the porch of my correspondent, and a pair of vireos had a nest with young in some lilac bushes but a few feet away. The writer had observed the male bluebird perch in the lilacs near the young vireos, and, he feared, with murderous intent. On such occasions the mother vireo would move among the upper branches much agitated. If she grew demonstrative the bluebird would drive her away.

One afternoon the observer pulled away the leaves so as to have a full view of the vireos' nest from the seat where he sat not ten feet away. Presently he saw the male bluebird come to the nest with a worm in its beak, and as the young vireos stretched up their gaping mouths he dropped the worm into one of them. Then he reached over and waited upon one of the young birds as its own mother would have done. A few moments after he came to his own brood with a worm or insect, and then the next trip he visited the nest of the neighbor again, greatly to the displeasure of the vireo, who scolded him sharply as she watched his movements from a near branch.

My correspondent says: "I watched them for several days; sometimes the bluebird would visit his own nest several times before lending a hand to the vireos. Sometimes he resented the vireos' plaintive fault-finding and drove them away. I never saw the female bluebird near the vireos' nest."

Another correspondent relates an equally curious incident about a wren and some young robins. "One day last summer," he says, "while watching a robin feeding her young, I was surprised to see a wren alight on the edge of the nest in the absence of the robin and deposit a little worm in the throat of one of the young robins. It then flew on about ten feet, and it seemed as if it would almost burst with excessive volubility. It then disappeared, and the robin came and went, just as the wren returned with another worm for the young robins. This was kept up for an hour.



Once they arrived simultaneously, when the wren was apparently much agitated, but waited impatiently on its previous perch, some ten feet off, until the robin had left, when it visited the nest as before. I climbed the tree for a closer inspection, and found only a well-regulated nest. After coming down I walked around the tree and discovered a hole, and upon looking in saw a nest of sleeping, featherless wrens. At no time while I was in the vicinity had the wren visited these little ones.

Of all our birds, the wren seems the most overflowing with life and activity. Probably in this instance it had stuffed its own young to repletion when its own activity bubbled over into the nest of its neighbor.

I have myself known but one instance of a bird lending a hand in feeding young not its own. This instance is to be set down to the credit of a female English sparrow. A little "chippie" had on her hands the task of supplying the wants of that horse-leech, a young cow-bunting.

The sparrow looked on from its perch a few yards away, and when the "chippie" was off looking up food it would now and then bring something and place it in the beak of the clamorous bunting. I think the "chippie" appreciated its good offices. Certainly its dusky foster-child did. This bird, when young, seems the most greedy of all fledgelings. It cries, "More," "More," incessantly. When its foster-parent is a small bird like "chippies" or one of the warblers, one would think it would swallow its parent when food is brought it. I suppose a similar spectacle is witnessed in England when the *cuckoo is* brought up by a smaller bird, as is always the *case.*

Last evening I saw a cow-bunting fully grown following a "chippie" sparrow about clamoring for food, and really looking large enough to bite off and swallow the head of its parent, and apparently hungry enough to do it. The "chippie" was evidently trying to shake it off and let it shift for itself, for it avoided it and flew from point to point to escape it. Its life was probably made wretched by the greedy monster it had unwittingly reared.

HASTY OBSERVATION.

The careful observer is not long in learning that there is truth in the poet's remark, that "things are not what they seem." Everywhere on the surface of nature things seem one thing, and mean quite another. The hasty observer is misled by the seeming, and thus misses the real truth.

The little green snake that I saw among the "live-forevers" the other day, how nearly it escaped detection by the close resemblance of its color to that of the plant! And when, a few days later, I saw one carelessly disposed across the top of the bending grass and daisies, but a few feet from where I sat, my eye again came near being baffled.

The little snake was probably lying in wait for some insect. Presently it slid slowly down into the grass, moving so slowly as to escape any but the most watchful eye. After its head and a part of its body were upon the ground, its tail still pointed straight up, and exactly resembled some fresh vegetable growth. The safeguard of this little snake is in his protective coloring; hence his movements are much more slow and deliberate than those of the other snakes.

This simulation is very common in nature. Every creature has its enemy, and pretends to be that which it is not, in order to escape detection. The true frog pretends to be a piece of bark, or a lichen upon a tree; the wood-frog is the color of the dry leaves upon which it hops, though when spawning in the little black pools and tarns in spring, its color is very dark, like the element it inhabits.

One day, in my walk in the woods, I disturbed a whip-poor-will where she sat upon her eggs on the ground. When I returned to the spot some hours afterward, and tried to make out the bird upon her nest, my eye was baffled for some moments, so successful was she in pretending to be only a mottled stick or piece of fallen bark.

Only the most practiced eye can detect the partridge (ruffled grouse) when she sits or stands in full view upon the ground in the woods. How well she plays her part, rarely moving, till she suddenly bursts up before you, and is gone in a twinkling! How well her young are disciplined always to take their cue from her! Not one will stir till she gives the signal.

One day in my walk, as I paused on the side of a steep hill in the edge of the woods, my eye chanced to fall upon a partridge, sitting upon the leaves beside a stump scarcely three paces from me. "Can she have a nest there?" was my first thought. But then I remembered it was late in the summer, and she certainly could not be incubating. Then why is she sitting there in that exposed manner?

Keeping my eye upon her, I took a step forward, when, quick as a flash, she sprang into the air and went humming away. At the same moment all about me, almost from under my feet, her nearly grown young sprang up and went booming through the woods after her. Not one of them had moved, or showed fear till their mother gave the word.

To observe nature and know her secrets, one needs not only a sharp eye, but a steady and patient eye. You must look again and again, and not be misled by appearances. All the misinformation about the objects and phenomena of nature afloat among country people is the result of hasty and incomplete observation.

In parts of the country where wheat is grown there is quite a prevalent belief among the farmers that if the land is poor or neglected, the wheat will turn into chess or cheat grass. Have they not seen it, have they not known the wheat to disappear entirely, and the chess to be there in its place?

But like so many strange notions that are current in the rural districts, this notion is the result of incomplete observation. The cheat grass was there all the while, feebler and inconspicuous, but biding its time; when the wheat failed and gave up possession of the soil the grass sprang forward and took its place.

Nature always has a card to play in that way. There is no miracle nor case of spontaneous generation about the curious succession of forest trees — oak succeeding pine, or poplar succeeding birch or maple — if we could get at the facts. Nature only lets loose germs which the winds or the birds and animals have long since stored there, and which have only been waiting their opportunity to grow.

A great many people are sure there is such a creature as a glass snake, a snake which breaks up into pieces to escape its enemies, and then when danger is past, gets itself together again and goes its way.

Not long since a man published an account in a scientific journal of a glass snake which he had encountered in a hay-field, and which, when he attempted to break its head, had broken itself up into five or six pieces.

He carefully examined the pieces and found them of regular lengths of three or four inches, and that they dovetailed together by a nice and regular process. He left the fragments in the grass, and when he returned from dinner they were all gone. He therefore inferred the snake had reconstructed itself and traveled on.

If he had waited to see this process, his observation would have been complete.

On another occasion, he cut one in two with his scythe, when the snake again made small change of itself. Again he went to his dinner just at the critical time, and when he returned the fragments of the reptile had disappeared.

This will not do. We must see the play out, before we can report upon the last act.

There is, of course, a small basis of fact in the superstition of the glass snake. The creature is no snake at all, but a species of limbless lizard, quite common in the West. And it has the curious power of voluntarily breaking itself up into regular pieces when disturbed, but it is only the tail which is so broken up; the body part remains intact.

Break this up and the snake is dead. The tail is disproportionately long, and is severed at certain points, evidently to mislead its enemies. It is the old trick of throwing a tub to a whale. The creature sacrifices its tail to secure the safety of its body. These fragments have no power to unite themselves again, but a new tail is grown in place of the part lost. When a real observer encountered the glass, or joint-snake, these facts were settled.

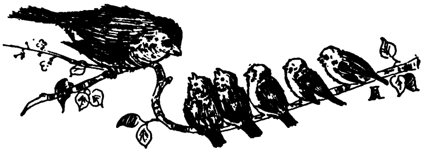
The superstition of the hair-snake is founded upon a like incomplete observation. Everywhere may be found intelligent people who will tell you they know that a horsehair, if put into the spring, will turn into a snake, and that all hair-snakes have this origin. But a hair never turns into a snake any more than wheat is transformed into chess. The so-called hair-snake is a parasitical worm which lives in the bodies of various insects, and which at maturity takes to the water to lay its eggs.

What boy, while trout-fishing in July and August, and using grasshoppers for bait, has not been vexed to find the body of the insect, when snapped at by the trout, yielding a long, white, brittle thread, which clogged his hook, and *spoiled the* attractiveness of the bait? This thread is the *hair-worm.*

How the germ first gets into the body of the grasshopper I do not know. Probably in some way with its food. After the creature leaves the insect, it becomes darker in color, and harder and firmer in texture, and more closely resembles a large hair.

See what pains the trapper will take to outwit the fox; see what art the angler will practice to deceive the wary trout. One must pursue the truth with the like patience and diligence.

The farmers all think, or used to think, that the hen-hawk was their enemy, but last spring the Agricultural Department procured three hundred hen-hawks, and examined the craw of each of them, and made the valuable discovery that this hawk subsisted almost entirely upon meadow mice, thus proving them to be one of the farmer's best friends.



The crow, also, when our observations upon his food habits are complete, is found to be a friend, and not an enemy. The smaller hawks do prey upon birds and chickens, though the pretty little sparrow-hawk lives largely upon insects.

Speaking of hawks, reminds me that I read the other day in one of the magazines a very pretty poem, in which a hawk was represented poised in mid-air, on motionless wing, during the calm of a midsummer day.

Now, of a still day, this is an impossible feat for a hawk or any other bird. The poet had not observed quite closely enough. She had noted (as who has not?) the hawk stationary in the air on motionless wing, but she failed to note, or she had forgotten, that the wind was blowing.

He cannot do it on a calm day; the blowing wind furnishes the power necessary to buoy him up. He so adjusts his wings to the moving currents that he hangs stationary upon them. When the hawk hovers in the air of a still day, he is compelled to beat his wings rapidly. He must expend upon the air the power which, in the former case, is expended upon him.

Thus does hasty and incomplete observation mislead one.

HOW TO OBSERVE NATURE.

To teach young people or old people how to observe nature is a good deal like trying to teach them how to eat their dinner. The first thing necessary in the latter case is a good appetite; this given, the rest follows very easily. And in observing nature unless you have the appetite, the love, the spontaneous desire, you will get little satisfaction. It is the heart that sees more than the mind. To love nature is the *first* step in observing her. If a boy had to

learn fishing as a task, what slow progress he would make; but as his heart is in it, how soon he becomes an adept.

The eye sees quickly and easily those things in which we are interested. A man interested in horses sees every fine horse in the country he passes through; the dairyman notes the cattle; the bee culturist counts the skips of bees; the sheep-grower notes the flocks, etc. Is it any effort for the ladies to note the new bonnets? new cloaks upon the street? We all see and observe easily in the life of our business, our tasks, our desires.

If one is a lover of the birds he sees birds everywhere, plenty of them. I think I seldom miss a bird in my walk if he is within eye or ear-shot, even though my mind be not intent upon that subject.

The mind of an observer is like a gun with a hair-trigger — it goes at a touch, while the minds of most persons require very vigorous nudging. You must take the hint and take it quickly if you would get up any profitable intimacy with nature. Above all, don't jump to conclusions, look again and again; verify your observations. Be sure the crow is pulling corn and not probing for grubs before you kill him. Be sure it is the oriole purloining your grapes and not the sparrows, before you declare them your enemies.

I one day saw humming-birds apparently probing the ripe yellow cheeks of my finest peaches, but I was not surprised till I saw a bird hovering over a particular peach, and then mounting up the ladder I examined it, when sure enough, the golden cheek was full of pin holes. The orioles destroy many of my earliest pears, but it required much watching to catch them in the very act. I once saw a phœbe-bird swoop down upon a raspberry bush and carry a berry to a rail on a near fence, but I did not therefore jump to the conclusion that the phœbe was a berry-eater. What it wanted was the worm in the berry. How do I know? Because I saw it extract something from the berry and fly away.

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